



Environmental self-identity, self-efficacy, and the emergence of green opinion leaders: An exploratory study

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ABSTRACT

Environmental issues have gradually become one of the most challenging global issues. In this Information Age where individualism is on the rise and self-media is prevalent, if we can use the power of individuals and make ordinary people become self-driven Green ambassadors to influence everyone around them, their power will be incomparable. This bottom-up force may even shake the entire society. However, how these “Green Opinion Leaders (GOLs)” are created is still an unresolved question. If we can understand the formation process of these GOLs, we may have the opportunity to generate more GOLs in the future. Therefore, this study applied participant observation methods to penetrate three local mountain hiking societies in Taiwan and conduct long-term tracking and unstructured in-depth interviews with five mountain hikers to understand why they eventually became Green Opinion Leaders (GOLs). The results show that “environmental self-identity” and the related “self-efficacies” of social and marketing abilities are the key elements making ordinary mountain hikers become GOLs. The four essential elements that form an environmental self-identity include (1) love of nature, (2) environmental consciousness, (3) environmental self-efficacy, and (4) nature self-identity. Finally, the research summarizes a series of efficient prescriptions for encouraging ordinary people to become Green Opinion Leaders (GOLs).

1. Introduction

Environmental issues have become an international issue these days. Governments and NGOs working hard to promote environmental protection, but the effects are still limited. Why not make every ordinary person an environmental ambassador? Many ordinary people around the world have already successfully introduced greener lifestyles to their friends and families through their influence. Some of these people are mountaineers, some are diving or sailing addicts, and some simply enjoy the company of wildlife. However, the one thing in common is they all love nature and outdoor activities very much. With the curiosity about how these self-driven little pioneers of environmental protection become who they are now, we decided to conduct this research.

Environmental issues have always been a topic that is often discussed, but easily ignored by people since it is far away from our lives. According to BBC News of 2020, the Atlantic Ocean contains up to 21 million tonnes of micro-plastic waste, the spending of governments to prevent climate change is rising to new heights in recent years, and pollution is killing wildlife every second

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all around the world, making biodiversity continue to decline. A report from the European Environment Agency (EEA) in 2020 also points out that in Europe, one in eight deaths is linked to pollution. The causes of death include air pollution, sound pollution, dirty water, and chemical pollution, and the biggest victims are poor communities and underprivileged groups.

Some governments, firms, organizations, and consumers are aware of these problems and have started to take action. In this war against environmental destruction, individuals have played important roles. People care about the ethics of companies more than ever. Consumers have started to pay attention to environmental issues, especially the younger generations. More and more consumers with environmental consciousness have started to fight against polluting enterprises by refusing, boycotting, and protesting. Unscrupulous companies are forced to change their behavior or face bankruptcy and shut down eventually. This power from the bottom can sometimes even shake governments and bring the emergence of new policies.

In the age of self-media, the power of ordinary people is unlimited. The influence of individual opinion leaders is growing [1]. Sometimes a word from an individual key opinion leader (KOL) can be even more powerful than government policy propaganda and corporate/organization advertising. According to research, consumers are already tired of seeing well-organized ads and longing to see some “authentic content”. They believe word-of-mouth communications are more robust and credible than advertising content [2]. This is also a reason why influential YouTubers can rise to become a kind of celebrity today. Since people trust their friends and families more than other information sources, personal influencers are thriving, and authentic content becomes one of the most favorable types of content, why not create more individual green ambassadors to awaken the public’s attention to environmental issues, such as “Green opinion leaders (GOLs)”?

In the beginning, social marketing research focused on changing minds and thoughts by employing marketing methods [3]. With the development over time, current social marketing scholars have turned their attention to changing behavior [4]. “How to change target audiences’ behavior more painlessly?” becomes one of the main issues. Being told what to do is painful, but wishing to become someone you like is exciting. Therefore, the relationship between individual opinion leaders (OL) and social issue promotion has become a hot topic in social marketing research. The power of personal influencers in marketing environmental issues has been widely discussed in related academic fields. Nisbet and Kotcher also indicated the power of opinion leaders (OLs), who find a way to use their influence to promote climate change issues [5].

However, there are still some gaps in this research area. Social marketing research in the environmental protection area can be divided into two groups - one is targeting businesses and the other is targeting the customer. The former only focus on solving environmental issues in top-down ways (instead of bottom-up), like “finding ways to change firms’ actions” or trying to persuade companies to pay more attention to their corporate social responsibility (CSR). The latter often focus on how to make better social marketing content but don’t pay much attention to the way of creating more social marketing promoters, and seldom discuss the effect of individual influencers, too. Some recent research has talked about the power of opinion leaders (OLs) in promoting environmental issues [5], but there is still no research trying to find out how these self-driven Green Opinion Leaders (GOLs) are formed.

We believe this is a critical topic because by knowing the secrets of the ways to generate GOLs, social marketers will be able to use this knowledge to encourage more ordinary people to become GOLs. As a result, we conduct this qualitative research following interpretive research principles to find out the answers. The main research question of this paper is: how do ordinary people become GOLs? We observe the target groups of mountain climbing societies from an insider’s view by participant observation because most of the GOLs are nature and outdoor activity lovers. Then we conduct unstructured in-depth interviews with five GOLs from different mountain climbing societies to understand more detail about their mind-changing processes. The findings are presented in rich detail, and a framework of the GOLs-generating process is provided with them. Managerial implications are also discussed in the end.

2. Conceptual overview

2.1. Opinion leaders (OLs)

During the environmental protection (EP) promoting process, opinion leaders (OLs) have long been one of the most underestimated resources. Opinion leaders (OLs) are those people with distinguishing levels of personality strength, good at shaping others’ opinions, and seeming more confident in leadership roles [6]. They are the kind of people with strong influence, and their power is even strengthened nowadays in the digital world. According to Nisbet and Kotcher, opinion leaders can help to draw others’ attention to specific issues, products, and behaviors, and even send signals to tell people how to react and what to do [5]. The influence of opinion leaders (OLs) is shown in various aspects. Weimann indicated that opinion leaders (OLs) could influence others by providing advice, being others’ role models, or convincing others [7]. They can be very persuasive as an individual, even when they have no substantive status. As Nisbet and Kotcher pointed out, opinion leaders (OLs) don’t need to own real power or be in a specific position to exert their influence, they are the communicators and connecting people who remind peers of what political events, social issues, and consumer choices to pay attention to Ref. [5]. This is also the reason why the authors believe that opinion leaders (OLs) can play critical roles in promoting environmental issues. When they care, others follow.

It is hard for environmental protection information to get into the public’s eyes because people tend to select media content based on their personal preference for different public affairs [8]. How to draw the public’s attention and make people care becomes one of the biggest problems for social marketers. As fake news and ads abound, audiences’ trust in traditional media is declining, and they started to turn their trust to their friends, family, colleagues, and peers [9]. Therefore, individual influencers such as opinion leaders can easily become the kind of promotion ambassadors who raise people’s awareness of specific issues.

According to the research, others can shape an individual's behavior and opinions [10,11]. Goldsmith and Goldsmith also find the influence of acquaintances on personal and family recycling behavior is higher than government advertisements [12]. The influence of opinion leaders not only occurs in the change of mind but also in the change in consumer behavior. Word-of-mouth communications have become more and more persuasive and reliable to consumers [2]. Research also shows consumers will search for friends' and influential others' advice when they encounter uncertain situations during decision processes [13,14,15,16]. These all give opinion leaders (OLs) great potential to become good Green ambassadors. With the information spreading power and the influence on others' thoughts and behavior, they can become perfect Green Opinion Leaders (GOLs).

2.2. Green opinion leaders (GOLs)

Opinion leaders often play leading roles in adopting and introducing new products to the market [1]. Opinion leaders are not only influential people but also innovators and new-product adopters [17,18]. Therefore, when they become environmentally conscious, they have great potential to become the first group of Green adopters to introduce a more environmentally friendly way to the public.

Moreover, opinion leaders are also a group of people that commit a lot to environmental issues. According to Keller and Berry, influencers tend to be more willing to pay more for environmentally friendly goods than ordinary people [9]. For instance, they are willing to spend more money on energy-efficient cars and green electricity [9]. Nisbet and Kotcher also point out the critical roles opinion leaders play in environmental marketing and divide former research in this area into two groups: (1) research about political mobilization and (2) research related to personal behavior and consumer choice [5]. They even summed up a set of methods for identifying, recruiting, and training environmental opinion leaders to make the most of them in promoting environmental protection [5].

However, previous research related to this area only focuses on how to identify and recruit "existing opinion leaders" to help promote environmental issues but ignores the importance of understanding how to create self-driven Green Opinion Leaders (GOLs). As a result, this is the central question our research aims to uncover.

2.3. Self-identity and environmental self-identity

"Self-efficacy" was first proposed by Albert Bandura (1977), which refers to people's judgment of how well they can cope with possible future challenges [19]. In other words, it is people's belief in their ability to accomplish a certain task. People develop their "self-efficacy" by interpreting four main influence messages: (1) mastery experiences, (2) vicarious experiences, (3) social persuasion, and (4) emotional and physiological states [19].

First, regarding "mastery experiences", past successful experiences can greatly enhance a person's self-efficacy [19]. And the way to make people better at learning new things and completing new tasks is to make them believe that they have the ability to do it. Therefore, the authors speculate that for ordinary people to become GOLs, they must first believe that they have the ability to implement and promote environmental protection, which is the "Environmental Self-Efficacy" mentioned in this study. Second, regarding "vicarious experiences", when we see people similar to ourselves succeed, we will be more convinced that we have the ability to do it, too [19]. These social role models for reference include one's parents, teachers, employers, older siblings, older friends, or others that one can look up to as role models. Everyone may be a social role model for some people, which means that every individual can have a great influence on others around them. When people become green ambassadors, they will also have positive impacts on the "Environmental Self-Efficacy" of the people around them. They may lead the people around them to become more environmentally friendly, and even generate a positive Green force.

Third, regarding "social persuasion", receiving positive feedback when doing a challenging task will make people more confident that they can do it successfully. Both encouragement and dissuasion can affect a person's self-efficacy when doing something [20]. Therefore, positive feedback also plays an important role in the process of cultivating GOLs. Finally, regarding "emotional and physiological states", it is easier for people with good emotional and physiological states to improve their self-efficacy, and vice versa [21]. However, Bandura also emphasized that the point is not the intensity of emotions and physical responses, but how people perceive and interpret their emotions [19]. People with high self-efficacy tend to see emotional arousal as a motivator, whereas those with self-doubt may see it as a debilitating factor [19].

In addition, James Maddux also proposed a fifth factor that affects self-efficacy, "imaginal experiences" [22]. By imagining and visualizing their success, people will also become more confident in their ability to achieve it [22]. People's abilities are also affected by their beliefs. People with high self-efficacy are more likely to recover from setbacks, they tend to think about how to achieve their goals, rather than worrying about what may happen badly [23]. Therefore, people with high self-efficacy will also have a better chance to overcome difficulties and become GOLs who can influence others.

To make an ordinary person spontaneously become a Green Ambassador and even Green Opinion Leader (GOL), "environmental self-identity" is the key. Clayton pointed out environmental identity is a sense of connection with nature, which can make people feel like a part of nature and help people produce environmental behaviors [24]. Werff, Steg, and Keizer define "environmental self-identity" as the degree people think their behaviors are environmentally friendly [25]. The stronger the environmental self-identity, the more it can encourage one's environmental actions [25]. According to Werff, Steg, and Keizer, environmental self-identity depends on biospheric values and past behavior [25]. Therefore, people can recall their previous environmental behaviors and increase their "environmental self-identity" to stimulate their environmental behaviors [25]. This can mean the more we do what GOLs will do, the more we will strengthen our self-identification as a GOL.

3. Methodology

3.1. Research questions

Our research examines the formation process of Green Opinion Leaders (GOLs) with attention to the perspective of self-efficacy and self-identity, and explores two focal research questions:

RQ 1. What makes one become a GOL?

RQ 2. How to create GOLs proactively?

The core issue is to explore the state of mind change and the mental journey of ordinary people becoming green ambassadors. By understanding this key, we can better understand the background factors of the formation of GOLs and also better control, predict, and even promote people's pro-environmental behavior in the future.

Therefore, we adopt interpretive research approaches, which are particularly suitable for researchers aiming to discover new phenomena and capture rich detail from the field and informants [26,27].

3.2. Research context

We observed most Green Opinion Leaders (GOLs) are outdoor activity and nature lovers. Klein and Hilbig also point out that exposure to the natural environment can encourage environmental behavior [28]. People who like outdoor activities also tend to love nature and have more potential to become Green practitioners or even Green Opinion Leaders (GOLs). Thus, we choose Taiwan, a country with many popular mountains and outdoor activities, to conduct this research. We chose mountain hiking societies as the observation field for participant observation and chose mountain hikers as focal informants because these are the perfect places and people for us to answer our research questions.

Mountain hiking societies are a good environment for us to observe and experience the transformation process from ordinary people to Green ambassadors. We can observe the atmosphere that causes behavior and thought changes from an insider's view, experience the entire process of mental transformation as a member of mountain hiking societies, and collect field data at any time through observation and unstructured interviews of the target research objects.

Our research will be conducted in the field during mountain hiking and also during the gathering meal afterward. The researcher joined different mountain hiking societies and social groups to experience the whole hike and provide an insider's view. The research involves mountain hikers who are already GOLs, and mountain hikers who are not GOLs but have started to display more environmental behavior than before.

3.3. Research methods and data collection

We follow interpretive research instructions and use participant observation and unstructured in-depth interviews as the two main research methods. Informed consent was obtained from all observed objects, and the overview of study participants was listed in Table 1.

(1) Participant observation.

We joined three mountain hiking societies in Taiwan (R.O.C.) between September 2016 and December 2021 and started mountain hiking in September 2016. The researcher is a complete participant in the entire process to understand the languages, the culture, and the mental and behavioral changes of mountain hikers to provide an insider's view. At first, we were just ordinary people who started to do outdoor activities and tried to connect to nature. We joined mountain hiking activities held by mountain hiking societies every weekend in the first 6 months, then started to do mountain hiking in a smaller group with 2~7 closer friends, after we became familiar with the mountain hiking society members and became real mountaineers ourselves. To collect in-depth data from an insider's view, we actively participate in club activities and try to get acquainted with the core members of society. After six months of hard work, we became a part of the core members and even received certificates that are only available to senior members and handwritten thank you cards from the head of a mountain hiking society. The researcher has also fallen in love with mountain hiking and nature, and become a Green practitioner and Green Opinion Leader (GOL), implementing green life every day, becoming a green ambassador among friends,

Table 1
Overview of study participants.

Pseudonym	Sex	Age	Type of Mountain Hiker
Den	Male	20s	Mountain Hiking Society Leader
Chi	Male	30s	Mountain Hiking Society Leader
Wen	Female	30s	Mountain Hiking Green Opinion Leader
Kuei	Male	60s	Mountain Hiking Green Opinion Leader
Amy	Female	50s	Mountain Hiking Beginner

and running a blog (Facebook fans page, Instagram, and WordPress blog) to share information on outdoor life and environmental protection. We observe and experience environmental behavior changes and the entire transition process from ordinary people to Green practitioners and even GOLs as one of the research objectives. We record all the data, information, and feelings right after every field trip through notes, photos, and videos, collect important relevant materials, and organize them during the research period. In addition, we also observe and interview other target informants to fulfill the needed information and data, during mountain hiking and social gathering with society members. The related data and information on the social media platforms and websites of mountaineering groups are also collected and organized by the researchers. Table 2 summarizes the profiles of each observed mountain hiking society (see Table 2).

(2) Unstructured in-depth interviews.

We conducted long-term tracking and unstructured in-depth interviews with five informants from Taiwan (R.O.C.), three males and two females, aged 27 to 62, who were already engaged in mountain hiking for more than a month (1 month ~ 5 years). The informants were recruited from mountain hiking activities and three mountain hiking societies and selected by their self-reported and observed influential power and environmental behavior. Four of the informants were already Green Opinion Leaders (GOLs), and the other one is a mountain hiking beginner. Two informants among the 4 GOLs were heads of mountaineering clubs, and the other two were green opinion leaders among friends and families. Each of the five informants participated in 2–5 unstructured interviews, each interview ranging from 10 to 60 min and recorded by notes and typing after the field trip. All interviews were conducted in Mandarin because Mandarin is the first language of all the informants. We interviewed “mountain hiking beginners” to understand the changes in their environmental awareness, attitudes, and behaviors after they began mountain hiking. We interviewed GOLs to discover the deep mental and behavioral transition from ordinary people to green promoters. The unstructured in-depth interviews are conducted in the field when chatting during mountain hiking activities and social gatherings. We started with general questions to make new friends and understand the backgrounds of each informant. Then, we took a step closer to asking more in-depth questions related to our core research questions (such as “How do you start sharing environmental protection topics?”, “Why would you like to share these experiences and information with others”, “what makes you care about environmental issues”, etc.). Since we are friends with the interviewee, we will conduct unstructured in-depth interviews via chat at various times. We collected rich data from the time our informants started mountain hiking, the process by which they began to show behavioral changes and become Green practitioners, to the period after our informants became Green promoters and even Green Opinion Leaders (GOLs).

3.4. Data analysis

Field notes of participant observation and transcripts of the unstructured in-depth interview served as the basis for our data analyses. All collected data is systematically summarized, sorted, coded, and analyzed. The authors first recorded the field data collected in interviews and participant observations in the form of notes and made a preliminary classification according to time, place, object, group, and whether they have already become GOLs. Then, the data are coded according to different situational backgrounds, observation/interview questions, and psychological states of the observed subjects. Then analyze and summarize through continuous cross-comparison, and gradually summarize the answers to exploratory research questions. During the process, the authors continue to question and confirm the observed objects through unstructured interviews and observation according to the progress of the research, until there is no new discovery has been found.

We focus on our research questions and relevant theories to carry out the coding and analysis of the field notes and conduct within-case and across-case analyses among our informants. For the participant-observation field data analyses, all the field notes, photos, and videos were analyzed to understand the overall journey of becoming a Green Opinion Leader (GOL) as well as the characteristics, categories, ecology, and culture of mountain hikers. For the within-case analyses of the unstructured in-depth interview data, each transcript of the informants was analyzed to understand the mental and behavioral transition of GOLs and identify the key elements and formation process that makes ordinary people become GOLs. Finally, in our across-case analysis, we looked back and forth between different cases and relevant literature to compare and reorganize the interview transcript and develop new understandings of the deeper thoughts and context of our informants.

4. Findings

In the past, governments, environmental protection organizations, and social marketers only waited passively for green ambassadors to automatically form by themselves, instead of creating them proactively. Since the public environmental consciousness increase via self-driven Green Opinion Leaders (GOLs) is much greater than celebrity endorsers hired by governments and environmental

Table 2
Observed mountain hiking societies in Taiwan (R.O.C.).

Society Name	Join Time	Number of Members	Society Leader
Hiking 7	2016/9	61,738 (2022)	Yang
Deng-Shan-Qu	2021/1	6 (2021)	Chi
Kui-Yue-Qian-Zhang	2017/4	4 (2021)	Den

protection organizations, we are going to provide the world with an efficient way to create GOLs. We provide an in-depth understanding of how ordinary mountain hikers become GOLs and sum up a set of effective methods for governments and social marketers to create GOLs systemically.

We find that “environmental self-identity” and the “related self-efficacies” of social and marketing abilities are the key elements making ordinary people become GOLs. According to the participant observation and unstructured in-depth interview results, we list four essential elements that form an environmental self-identity: (1) love of nature, (2) environmental consciousness, (3) environmental self-efficacy, and (4) nature self-identity. Further, we also lay out a series of efficient prescriptions for selecting, encouraging, and recruiting potential GOLs.

This research presents the findings in two sections, including environmental self-identity and green opinion leaders and social self-efficacy, and marketing self-efficacy. We first describe how environmental self-identity helps people become GOLs and provide an efficient way to generate environmental self-identity. Then, we describe how related self-efficacies (social self-efficacy and marketing self-efficacy) help mountaineers to become real green opinion leaders. Finally, in table 3 we provide a summary of results about the key elements and suggestions for the generation of green opinion leaders (Table 3).

4.1. Environmental self-identity and green opinion leaders

Environmental self-identity and related self-efficacy of social and marketing abilities are the key elements making self-driven Green Opinion Leaders (GOLs). We found it is not easy to become a GOL spontaneously because GOLs play the role of voluntary environmental advocates and environmental ambassadors. The material benefits that can be directly obtained by becoming a GOL are so small that it is difficult to become a strong inducement. It is also unreasonable to say the main driving force for people to become a GOL is to gain public praise and reputation. Since there are so many other ways to gain the affirmation of others and prestige, there is no need to choose such a difficult way by becoming a GOL. Therefore, there must be other real reasons and main driving forces hidden behind them. And this main driving force is the environmental self-identity which enables people to have a strong sense of environmental protection.

Having environmental self-identity can encourage people to become self-driven GOLs, and help people maintain the enthusiasm and perseverance of being green ambassadors. However, how can we help a person produce the key environmental self-identity? We argue there are four essential elements for forming environmental self-identity: (1) love of nature, (2) environmental consciousness, (3) environmental self-efficacy, and (4) nature self-efficacy. Further descriptions are presented in the next section.

(1) Love of nature

Helping people to generate an environmental self-identity and encouraging them to become green opinion leaders who promote environmental protection concepts spontaneously is a difficult thing because viewing oneself as a part of nature and even becoming a green ambassador is a kind of self-driven voluntary behavior. Instead of only knowing the importance of environmental protection (EP), feeling like doing it from the bottom of one’s heart is also very important. Therefore, a love of nature becomes one of the most essential elements generating one’s environmental self-identity.

It’s hard for people to have an environmental self-identity without a love of nature, even when they totally understand the severity of environmental problems, or have a sense of environmental self-efficacy. As long as a person has not developed a love of nature, it is difficult for them to have an environmental self-identity and even harder for them to become green ambassadors such as Green Opinion

Table 3
Summary of results: Key elements and suggestions for the generation of green opinion leaders.

Key Elements for Generating GOLs	The Connotation of Elements	Definition	Suggestions on Ways to Encourage GOLs Generation.
Environmental Self-identity	Love of Nature	Caring, appreciation, and love for the environment and nature.	1. Immersive Nature Experiences
	Environmental Consciousness	Awareness of the importance and urgency of environmental protection.	1. Active Learning (actively search for relevant knowledge) 2. Passive Learning (learn through sharing and reminders from others)
	Environmental Self-efficacy Nature Self-identity	Confidence and belief in one’s own “ability to practice and promote environmental protection”. People view themselves as a part/member of nature.	1. Continuous Practices and Actual Actions 1. Recognition and Encouragement from Others 2. Process of Implementation 3. Near-death Experiences in Nature (unreproducible, uncontrollable, and unmanipulable)
Related Self-efficacies	Self-efficacies of Social Abilities	Self-efficacy in “social skills” such as relationship building, communication, and persuasion.	1. Past Successes 2. Encouragement and Positive Feedback from Others
	Self-efficacies of Marketing Abilities	Self-efficacy in terms of “marketing skills” such as advertising, promoting, and attracting target audiences.	1. Past Successes 2. Encouragement and Positive Feedback from Others

Leaders (GOLs).

One of the research informants — Amy, who is also a family member of one of the researchers, had lived in the mountain for about 17 years when this paper was first written. In the first 13 years, she didn't have much love for nature and outdoor activities even though she lived so close to nature. Most of the time, she stayed in the house and seldom walked into the yard. She hated exercise, so she seldom went mountain hiking either. In those years, she thought snakes, insects, and wild weeds were all harmful creatures, so she wouldn't have any hesitation or sympathy to remove them. However, in the last four years, she was convinced by one of her family members to start mountain hiking. She began to know nature and wildlife, and her attitude toward those so-called pests underwent a dramatic change. She started to happily share her new discoveries about animals and plants with friends and family and she also started showing love for nature. For example, she would say:

"I found a shedding snake skin in the yard (with an excited voice)."

After she started mountain hiking, she made many new friends who love and know things about wildlife. She started to learn from them and began to have more understanding of the creatures in nature. She often proudly shares her new findings of nature with friends and family:

"This wild weed is edible. It tastes good as a kind of vegetable. You can cook it with salt and sesame oil."

When other family members talked about how they killed a harmful viper, she said:

"No, I won't do it, I am not going to kill them (viper). I am living peacefully with them now."

She doesn't hate insects and wild weeds that much now. When she sees insects coming into the house, she will take them out instead of killing them like she used to do in the past. The wild weeds don't bother her that much anymore now, either. She will show mercy to them and even begin to appreciate their beauty.

As previous examples showed, when a person develops a love of nature, their attitude and behavior toward the environment and nature can be very different. Things that seemed to be irrelevant before, now all become relevant. Just as one of our unstructured in-depth interview respondents (Wen) said:

"Yeah, I knew the environment was getting polluted and environmental protection is important, but it was just too far from my daily life. To be honest, I didn't take it seriously until I started mountain hiking. But after I fell in love with mountains and nature, I began to feel like we were on the same side. When I see people picking flowers or cutting trees, I will feel so sad and angry like they are hurting my close friends. And I start to feel that I have the responsibility to protect them. Now I care about the environment much more than before. I carry environmentally friendly tableware with me every day. And I walk a lot or take the MRT instead of driving cars or riding motorcycles."

"When I see an unextinguished fire in the forest, I get very nervous, as if my own house is on fire. When I think about the consequences if it spreads, I feel obligated to put it out quickly. When I think about what those beautiful, pure, and innocent animals and plants may encounter, I can't bear it. I don't even dare to imagine it because it hurts so much. I just love these lives too much!"

Regarding the generation of love. To cultivate a love of nature, immersive nature experiences could be a very effective method. For example, outdoor nature activities like mountain hiking, diving, and sailing. According to Klein and Hilbig, "low rates of pro-environmental behavior (PEB) in the population have been explained by the declining frequency of experiences in nature due to urbanization and digitalization [28]." They also point out that not only real nature experiences but also virtual nature experiences have the effect of promoting environmental protection [28].

The feeling of love is based on getting along, just like the process of falling in love with someone. Getting along with nature does not necessarily produce love, but it can definitely increase a person's chances of falling in love with nature. If there is no contact with nature at all, there will be no chance to produce a love of nature. Modern people have fewer and fewer opportunities to get into contact with nature. They don't have much love for nature, so they feel the persecution of the environment has nothing to do with them. This is also one of the reasons why environmental problems have become more and more serious with the advancement of technology and urbanization.

The beauty of nature can be very moving to people. Increasing ordinary people's contact with nature not only produces the opportunity to awaken people's primitive feelings for the environment and nature but also increases the chance of them falling in love with nature. Den recalled the feeling when he started mountain hiking and found his relationship with nature was based on the "immersive nature experience" of mountain hiking activities which he joined every weekend:

"Although at first, it was very tiring to do mountain hiking, there was a feeling that even though it was exhausting, it was also extremely refreshing. The sense of physical and mental labor during the contact with land and nature, made me slowly establish a relationship with nature, and find an original connection with it."

In fact, the researchers heard similar statements from many of our mountaineering friends. As a complete participant and insider in the participant observation, the researcher agrees with these sentiments very much.

The researchers used to see environmental protection (EP) only as a slogan until they started to engage in outdoor activities such as mountain hiking and diving. When the researchers started to spend more and more time in the natural environment, they began to develop deeper and deeper feelings for animals, plants, and nature. They started to embrace nature and see animals and plants as friends, and view nature as their homeland. The more researchers get deeply in touch with nature, the more they are attracted to and moved by nature. Finally, they realize there is such a deep love and connection between man and nature.

In summary, the first essential element for forming environmental self-identity is the love of nature. If there is no love of nature, no matter how high people's environmental awareness is and how much influential power they have, there will be no motivation for them to view themselves and do things like environmentally friendly people, or even become GOLs. One of the best ways to cultivate "natural love" is through "immersive nature experiences."

(2) Environmental consciousness

There are many social issues. Why should people focus on promoting environmental issues? What makes them feel they must take environmental protection actions immediately? Only having a love of nature is insufficient to form an environmental self-identity or even make people become a Green Opinion Leader (GOL) spontaneously, they must also be aware of the importance and urgency of environmental protection. People who love nature may become animal lovers or outdoor lovers, but they will never have environmental self-identity and eventually be motivated to become GOLs who convince others to be environmentally friendly together unless they have environmental consciousness and two other key elements as well. To have an environmental self-identity and become a GOL, one must realize the seriousness of environmental damage and the importance of environmental protection. Only when people believe it is far from enough to do environmental protection occasionally or just do it by themselves, will they be stimulated to really take environmental protection actions into their lives and even influence others to do environmental protection together.

The researchers found all the observed GOLs have strong environmental consciousness, and this is also what motivated them to move from loving nature and performing environmental protection only occasionally to finally taking it seriously and start viewing themselves as environmentally friendly people:

Den is one of our participant observation focus objects and unstructured in-depth interview informants. He has learned more and more environmental protection information in the mountain hiking process, and his Environmental consciousness has been awakened this also makes him see himself as an “environmentally friendly person” and start to become a green ambassador among friends and family:

“At first, I only knew that throwing away trash is wrong, but I didn’t realize that throwing organic materials which look natural could cause great damage to natural ecology as well. After I started doing mountain hiking activities, everyone said — Leave No Trace (LNT) all the time and I also had a chance to see some related reports. That’s the time when I learned that not only trash is forbidden, but organic materials such as peels, seeds, and soups are also not allowed to be discarded in the mountains. After that, I began to pay more attention to not throwing this organic garbage in the natural environment and also taking the initiative to remind people around me. I would just keep telling them every time when I saw them trying to throw something that looked natural (which is not) in the mountain.”

The researchers saw Den stop a friend from throwing organic waste (peels and seeds) into the mountain. Den told that friend about how organic wastes can affect natural ecology and sharing relevant news with him by cell phone. Environmental consciousness not only changed his environmental behavior but also made him become a green ambassador and green opinion leader among his friends. After Den started mountain hiking activities for about six months, he established his own mountain hiking club. In 2020, he even encouraged one of his friends to start another mountaineering club, to lead more people to walk into nature and give them the opportunity to be touched by nature.

The generation of environmental consciousness. Environmental consciousness requires learning, and there are two different ways of learning, one is active learning, and the other is passive learning. Regarding active learning, for people who are already proactive, as long as their interests in nature are aroused, they will search and learn about environmental protection proactively by themselves. In fact, after the researchers started mountain hiking, they began to search for information related to environmental protection unconsciously. For example, at first, one of the researchers thought it was cool to start a fire in the wild until she saw a YouTube comment when she was surfing the internet for related information. The comment was left under a mountaineer-YouTuber’s video which recorded how he made a bonfire directly on the ground in the forest. The comment was left by a senior mountain hiker to kindly remind the YouTuber about the danger of making fire directly on the ground in the forest and the possible damage it could cause to the forest ecology. With this knowledge and environmental consciousness, the researcher not only became more careful when using fire in the forest but also began to share this knowledge with her friends and family. Eventually, the researcher herself also unconsciously became one of the self-driven green opinion leaders.

Regarding passive learning, for passive people, joining nature-related societies like mountain hiking clubs is very effective in learning about environmental protection. The supervision and advice of mountain hiking friends are strongly effective for mountain hiking rookies, especially when they have just joined a new mountaineering group and are eager to fit in quickly. To integrate into a group, they will try to learn the survival rules of the group as quickly as possible, including the rules of environmental protection. The researchers found many related cases in the participatory observation of mountain hiking societies, for instance:

When one of our observation subjects Ping just joined the mountain hiking society about one month, he broke a branch that blocked the view to let everyone take better pictures during a mountain hiking activity. This act of hurting trees made the other two members of the mountain hiking society a little bit angry and blame him for that. Since then, he has never shown similar behaviors again. The researchers found Ping has started to find good shooting spots by himself instead of destroying plants to get a good view during photography. After a period of learning, Ping became a senior member of the mountain hiking club. Now he not only treats creatures in the mountains very tenderly but also begins to take the initiative to share information about environmental protection in the mountain with others and become a green opinion leader.

Moreover, there are many other opportunities to learn environmental protection when participating in mountain hiking and mountain hiking societies. In the participant observation, the researchers found:

The heads of mountain hiking clubs all like to say the slogan – “Leave No Trace (LNT)” to remind every member not to take anything from the mountains or leave anything in the mountains during the hiking process. The group leader will also remind everyone to bring their own reusable tableware and raincoats before mountain hiking activities. When mountain hiking beginners see other mountaineering friends all bring reusable tableware and raincoats with them, they will yearn for these types of equipment as well. In fact, the environmental consciousness learned in the mountain hiking process will also unknowingly affect people’s environmental behavior in

daily life. According to Den's sharing after one of the mountain hiking activities:

"Few people care about who is littering in the city because no one wants to bother other people's business. But if people litter in the mountains, they will definitely be reminded by other mountain hikers. Since mountain hikers are more enthusiastic, and most of the people in the mountains are very nice, reminding these kinds of things is normal, and no one will be afraid of running into vicious people. In fact, once mountain hikers learn not to litter in the mountains, they will definitely not litter after returning to the city."

Therefore, in summary, to make people start to learn environmental self-identity and take the initiative to become GOLs to influence others to protect the environment, in addition to growing their love of nature, we must also let them learn deep environmental consciousness. People must understand what is good for the environment, what is bad for the environment, and also the reasons behind that, to truly realize the importance of environmental protection. Only with high environmental consciousness can people become GOLs and make more effort to influence others to conduct environmental protection together.

(3) Environmental Self-efficacy

Love of nature and environmental consciousness have been mentioned as the essential elements of creating environmental self-identity in previous articles. However, even if a person loves nature and is deeply aware of the importance of environmental protection, it is still impossible for him or her to generate an environmental self-identity without the relevant abilities. To believe in environmental self-identity, one must also have enough environmental self-efficacy. This is because when people believe they don't have relevant abilities, it will not only reduce their motivation for actions but also make them have no confidence to actually start the actions, and the key ability to generate environmental self-identity is environmental self-efficacy. Since this ability is the most important ability for creating environmental self-identity, focusing on cultivating environmental self-efficacy becomes the key to producing environmental self-identity.

In fact, Environmental Self-Efficacy (Environmental SE) can make people believe they have the ability to perform environmental protection, and even teach others to become more environmentally friendly. For example, tell their relatives and friends how plastic pollution affects marine ecology. Regarding this, one of the researchers has in-depth self-experience in the process of participant observation.

The researcher used to find it difficult to take away her own trash during mountain hiking because it was hard to keep holding the dirty garbage until they finally found a trash can at the bottom of the mountains. The whole process just seemed too painful and difficult. However, after a few months of mountain hiking, she learned an easy way to take away her own garbage from a mountain hiking friend which is — to bring a small plastic bag to hold her own garbage. In fact, as long as you do a good job of sorting and reducing the amount of garbage, it is not difficult to tie the garbage bags behind your backpack and take them down the mountain with you. With such environmental self-efficacy, the researcher began to take away all her trash during her mountain hiking processes, even including the toilet paper (which seems harmless to nature but actually isn't). Moreover, after having sufficient environmental self-efficacy, the researcher felt even more about belonging to nature. She also started to take the initiative to share relevant knowledge with other mountain hiking rookies and teach them how to sort out and take away their own garbage on their own.

Regarding the generation of environmental self-efficacy. It was found people will be more confident in their abilities through actual implementation. The actual implementation of environmental protection actions can give people the ability and confidence to carry out environmental protection. Through continuous practices and actual actions, people can also gradually develop a sense of environmental self-efficacy.

For instance, Amy didn't care much about the well-being of the forest before, but since she started mountain hiking every morning three years ago, she has started to be concerned about the protection of the forest environment. Once I was mountain hiking with Amy, I saw her advising a tourist who tried to discard rubbish, and she was very happy that she stopped the woman from polluting the forest environment successfully. She says:

"Don't worry, they will listen if you ask politely. When my husband and I went hiking last time, I saw a grandma burning dead leaves on the mountain route, so I took the initiative to stop her. After a long persuasion process, she finally put out the fire. For people like this, we just have to be brave enough to tell them before they cause any serious damage to the forest. I was a little bit scared at first, but then I found that as long as I explained it in a gentle way, they would usually listen."

In summary, in addition to having a love of nature and environmental consciousness, to generate environmental self-identity, it is also important to have the relevant environmental ability. People must realize they have the ability to become green opinion leaders before they can gain the confidence and motivation to actually take action. The most critical self-efficacy that must be cultivated for creating environmental self-identity is environmental self-efficacy. This is because environmental self-efficacy can give people the confidence to be environmentally friendly themselves, and even teach others about environmental protection and influence them to carry out environmental protection together. One of the most efficient ways to generate environmental self-efficacy is through continuous practices and actual actions.

(4) Nature self-identity

In this research, "nature self-identity" is defined as people viewing themselves as a part/member of nature, which differs from environmental self-identity is defined as people thinking of themselves as environmentally friendly people.

For an ordinary person to become an environmentalist voluntarily, he or she must first have the self-identity of being a part of nature, that is, "nature self-identity". If people just like mountain climbing, love nature, and agree with environmental protection, they will only become individual environmental protection (EP) practitioners or be the kind of EP supporters who only spread

environmental protection information occasionally. However, people with strong nature-self-identity will have a powerful enough sense of mission to become spontaneous green ambassadors dedicated to promoting environmental protection concepts, and even become long-term Green Opinion Leaders (GOLs). It was found that when you become a part of nature, things that previously had nothing to do with you will suddenly become intimately related to you. When people have changes in self-identity, they begin to believe in the connection between themselves and nature, identify their self-identity as a part of nature, and have the corresponding ability, with enough enthusiasm, perseverance, and confidence to volunteer to promote environmental protection concepts for a long time, and eventually become true self-driven GOLs.

In unstructured in-depth interviews, the results show natural outdoor activities lovers like to use words with strong nature self-identities to describe themselves when they talk about their love of nature, such as “people of the mountain”, “people of the sea”, and “a member of nature”. They are very proud of their nature self-identity, and such identities often make them feel they have a sense of responsibility and mission to protect the ecological environment. A mountain hiking society leader and senior mountain hiker Den shared with us after climbing Wuliaojian (a well-known mountain hiking trail in Taiwan):

“Those volunteer climbing coaches who guide the tourists on the “Wuliaojian” already regard this place as their home. This volunteering job occupies a very important part of their lives and also brings meaning to their lives. If this part is missing, their life will lose important meaning. “

When talking about environmental issues and personal environmental behavior, Den said:

“I insist on not littering mainly because I feel I am a part of nature and I should protect the mountains and forests. Mountains are where we often visit, so I don’t want to destroy the environment at all. Of course, the fear of being scolded by other mountain hikers is also a factor, but not the main reason.”

Another senior mountain hiker Wen also said in an unstructured in-depth interview:

“I used to talk about environmental protection, without really practicing it. But after I started mountain hiking, I felt like a mountain hiker and person of the mountain, protecting the forests and mountain environments is my duty now. I started to really change my behavior and tried to do things in a more environmentally friendly manner. I also feel I have the responsibility to share more, to encourage people around me to either walk into nature or protect the mountain environments together. “

Regarding this aspect, one of the researchers has an in-depth personal experience. On February 21, 2021, after the researcher had engaged in mountaineering activities for more than four years, she found a smoldering haystack while climbing Datong Mountain (a popular mountain trail in Taiwan). The researcher may not have been so concerned about this kind of thing before, however, after she started to engage in mountain hiking activities, she couldn’t help but be worried about it because she knew how dangerous wildfire could be. Since she already saw herself as a part of the mountain, preventing a forest fire was a duty for her. So she worked with other concerned mountain hikers to put out the fire with the drinking water they brought. They even went back and forth to the city to get more water to stop the fire. They were all very happy to see each other caring about the well-being of the forest, and finally, put out the fire together. They congratulated each other, and the researcher felt deeply proud of herself as a part of nature at that very special moment.

Through personal experience and unstructured in-depth interviews in the participant observation, the results show nature self-identity can be produced by actual implementation and recognition from others.

In terms of the generation of nature self-identity, the recognition and encouragement from others and the process of their own implementation all contribute to an enhanced environmental self-identity. One of our unstructured in-depth interviewees Wen said:

“After I started mountain hiking and shared it on my Instagram, my friends around me regarded me as a mountain hiking expert. They would ask me a lot of related questions, which made me feel encouraged. I like seeing myself as a part of the mountains very much, and I am proud of being “a mountain lover”. So I have become even more willing to share things like mountain hiking experience, adorable wildlife, and forest protection information.”

Regarding the personal feeling of one of the researchers herself in the participant observation, the researcher experienced the entire process of how her nature self-identity has been constantly strengthened by mountaineering activities. She feels the more time and effort she spends on mountain hiking, the more she feels like a member of the mountain and the deeper her connection with nature becomes.

In the beginning, the researcher only started mountain hiking activities for adding more exercise to life. However, as the frequency of mountain hiking gradually rose, her love for the mountains also grew. So the researcher began to take the initiative to share things about mountain hiking, and her friends also began to associate her with mountain hiking. Therefore, the researcher has become more and more aware of her nature self-identity as a member of the mountain and such nature-self-identity has become what the researcher expects of herself. She longs to return to nature and primitiveness and begins to feel she is standing with animals, plants, and nature. When she sees things and behaviors that cause environmental damage, she also feels she has the responsibility to share them to let everybody know. Thus, the researcher began to write blog posts about related topics and started to share relevant things with others. For example, the persecution of the elephants caused by the “elephant-riding” tourism activities, the severity of illegal forest logging, merchants selling a large number of collected shells, but hermit crabs can only find garbage bottle caps as their home, etc. In fact, the researcher herself has unknowingly become a real Green Opinion Leader (GOL).

In terms of strengthening nature-self-identity, it was found that a near-death experience in nature can actually strengthen people’s nature self-identity. One of our informants Wen said:

“I used to think the dangers and volatility of nature would scare everyone away. But after I went through a few experiences of almost dying during mountain hiking (getting lost in the mountain in heavy rain and suffer from hypothermia), facing a

threatening poisonous snake in the jungle, etc.). I realized these experiences not only can't stop me from contacting nature but also awakened my stronger awe and yearning for nature."

In fact, those who feel this way are not limited to mountain hikers. Many of the researchers' friends who are engaged in "natural outdoor sports" have similar feelings. They think having experienced these "near-death" tests in nature makes them feel they are even more a part of nature. A friend who loves sailing stated:

"After that (a near-death experience during sailing), I was greatly shocked ... I know that the danger of each sailing is unknown, and it is possible to even die on the journey. However, I'll still choose to continue sailing to the sea again and again because we are people of the sea."

4.2. Social self-efficacy and marketing self-efficacy

Becoming a self-driven Green Opinion Leader (GOL) requires not only motivation but also corresponding abilities. In addition to the environmental self-identity mentioned above, it is also very important to have the corresponding self-perceived abilities to become GOLs because the self-efficacy of these related abilities will help people be more confident and motivated to become real GOL. We summarized two major self-efficacies needed to become a self-driven GOL, which are social self-efficacy and marketing self-efficacy.

Strong environmental self-identity can lead to the motivation to become a GOL, while social self-efficacy and marketing self-efficacy can make people equip with the ability and confidence to truly take action. Therefore, when people have both environmental self-identity and the self-efficacy of social and marketing abilities, they will have a great chance to become GOLs.

First, Social Self-Efficacy (Social SE) can give people the confidence to influence and persuade those around them to start a more environmentally friendly life. For instance, recommending friends and families to go mountain hiking together, persuading others to reduce excessive consumption, etc. Second, Marketing Self-Efficacy (Marketing SE) can make people believe they have the ability to exert greater personal influence. This self-efficacy will also make them more confident and motivated to influence more people outside their social circle through the power of marketing. With the power of Marketing SE, they can bring more people to nature, and convince others to be environmentally friendly together. For example, becoming environmental bloggers and environmental YouTubers, or starting a mountain hiking club, etc.

Regarding Social Self-Efficacy, we found in participatory observations and unstructured interviews that people who become GOLs all have strong social skills. Moreover, when ordinary people gain Social SE, they will also be more capable and motivated to become green opinion leaders.

Every mountain hiking society the researchers participated in is led by leaders with strong social skills. They are good at making friends, understand how to get along with others very much, and they are all opinion leaders among friends and families. They not only founded mountain hiking societies to lead people to nature but also told people around them how to treat animals, plants, and the environment with gentleness in their daily lives.

In another observed case, the researchers have a mountain hiking friend called Chi. At first, he didn't have much confidence in his social skills. Although he liked mountain hiking, he felt embarrassed to share with others and had no confidence in leading others to mountain hiking either. However, after being encouraged by another mountain hiking friend — Den, he gained his "Social SE" and finally founded his own mountain hiking society. Den would say to Chi: "Hurry up and create a mountain hiking society! You have so many friends, you can definitely do it.", or "Wow, you are a real mountain hiker now! If you can't find anyone, just invite your colleagues to go mountain hiking together. It's easy!" After being encouraged, Chi began to slowly establish his own Social SE, and this eventually made him the head of a mountain hiking society and he had the confidence and ability to lead more people into nature.

This is the magical power of Social Self-Efficacy (Social SE). Just as another interviewee Kuei said:

"I know all these people and they are all my good friends. What can be difficult?"

Kuei has been engaged in mountaineering activities for about ten years. Not only does he have strong social skills and Social Self-Efficacy (Social SE), but he is also the leader of the local temple. He has dedicated himself to community greening for years. He is also a promoter of abolish-insect environmental protection campaigns in temples.

Regarding Marketing Self-Efficacy, when people have Marketing SE, they will have the confidence and ability to use their marketing capabilities to promote environmental protection, and they will also have a better chance of becoming GOLs. As one of our interviewees, Wen said:

"I have a professional background in marketing and my hobby is writing. I also run my own blog. So after I started mountain hiking, I fell in love with nature and realized the importance of environmental protection. I started to write blog posts to share my mountain hiking experience and the environmental protection knowledge I knew. Sometimes I share stories about animals and plants as well, to let more people have a chance to get to know about them. For me, blogging is very natural and simple. Of course, I don't feel weird or difficult to share because I'm just recording my life and sharing what I love. "

5. Discussion and conclusion

In the past, governments and environmental organizations used to promote EP concepts by spending money on celebrity endorsements or passively waiting for Green Opinion Leaders (GOLs) to be automatically generated. This research has provided more

effective options for governments and related NGOs. By understanding how GOLs are formed, they can create spontaneous GOLs proactively and make ordinary people become environmental ambassadors to influence everyone around them. With the bottom-up environmental voice and the power of influential individuals, the propaganda strength will be even more powerful.

This research chose Taiwan (R.O.C.), a country with plenty of famous mountains and outdoor activities to conduct this research. Through participant observation, the researchers went deep into three local mountain hiking societies and conducted long-term tracking and unstructured in-depth interviews with five mountain hikers.

The results show environmental self-identity and the related self-efficacies of social and marketing abilities are the key elements helping ordinary people become GOLs. Regarding the prescriptions for generating environmental self-identity, we sum up four essential elements that form an environmental self-identity: (1) love of nature, (2) environmental consciousness, (3) environmental self-efficacy, and (4) nature self-identity.

The author found in the personal experience of participant observation and interviews that people must produce “environmental self-identity” and develop related “self-efficacy” before they can truly become Green Opinion Leaders (GOLs). When people deeply identify with their status as environmental ambassadors, they will have a sense of mission that they must do something for the environment. Moreover, it is not enough just to have “environmental self-identity”. People must also truly believe that they have the ability to influence others and bring about changes before they start to take actions to spontaneously promote environmental issues and become GOLs in the real sense. The above two elements are indispensable. If there is no “environmental self-identity”, people will have no reason and motivation to promote environmental protection concepts to others; and if there is no self-efficacy in social and marketing skills, even if people want to promote environmental protection concepts, it is also easy for them to give up the idea because they don't feel that they can do it. Sometimes, they don't even have the courage to start.

Regarding the four basic elements of forming environmental self-identity: (1) "love of nature", research data shows that after people gradually fall in love with nature through contact, understanding, and immersive natural experience, they will begin to have the desire to love, care, and protect the natural environment, just like how we protect our loved ones; (2) "environmental consciousness", people must first realize the importance and urgency of environmental issues before they realize the need to start implementing and promoting this issue (3) "environmental self-efficacy", when people believe that they have the ability to implement and promote environmental protection concepts, they will have more courage and motivation to become green ambassadors; and (4) "nature self-identity", when people think they are a part of nature, seeing the environment being harmed is like seeing someone set fire to their own house or seeing their relatives being brutalized. They will go from outsiders to insiders, and it will be hard to continue to sit on the sidelines.

Green Opinion Leaders (GOLs) is a group of influential and spontaneous environmental ambassadors. Through the power of GOLs, governments and EP organizations can obtain effective environmental protection propaganda without spending a dime. As a result, it is suggested the government and EP organizations organize attractive outdoor activities in the future to cultivate the general public's understanding of nature and emotions toward the natural environment, in order to actively convene potential GOLs and encourage the generation of GOLs.

6. Limitations and future research

Regarding the opportunities for further research, first, this research only focuses on mountain hiking societies, related future researchers can look more into other outdoor societies which have members who also have great potential to become Green Opinion Leaders (GOLs), such as scuba diving societies and cycling groups ... etc. Second, this research only focuses on the mountain hiking societies in Taiwan. Although it provides a good example for other Asian countries that are transforming from emerging economies to developed countries, it lacks observations for Western countries and developed countries, so future researchers can look more in-depth into this particular aspect. Finally, discussing related research topics from the perspective of different nationalities, cultures, and socio-economic environments will also be an exciting entry point.

Author contribution statement

Wei-Ting Chen: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Ming-Huei Hsieh: Analyzed and interpreted the data.

Data availability statement

No data was used for the research described in the article.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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