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Environmental Concerns, Sustainable Consumption, and COVID-19 Fear in Online Consumers: A Research Exploration

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Abstract: *As a conceptual paper, this study examines the nuanced relationships between consumers' environmental orientations (egoistic, altruistic, and biospheric) and their sustainable consumption patterns, particularly emphasizing the prevailing influence of COVID-19 fear. Utilizing a targeted survey approach, responses from online Taiwanese and Thai consumers are gathered and analyzed through a Structural Equation Model, incorporating diverse analytical avenues such as path, mediation, moderation, and multi-group analyses. The study aims to describe prosocial consumers by their distinct environmental concerns and subsequent sustainable consumption behaviors. Furthermore, the study sheds light on how the COVID-19 pandemic has modulated the dynamic between environmental considerations and tangible sustainable consumption actions. In a post-pandemic setting, the study contributes to academic discourse by highlighting the confluence of environmental consciousness and sustainable consumption. It also provides pragmatic implications for businesses, directing them towards eco-centric product offerings and cultivating a deeper ecological awareness among consumers, fostering sustainable purchase intention and behaviors.*

Keywords: sustainable consumption; environmental concerns; COVID-19 fear; Taiwan; Thailand.

JEL Classification: M30; M31; Q01; A12; R11.

Introduction

This study investigates consumers' post-lockdown sustainable consumption behavior in the context of the COVID-19 pandemic. The pandemic has prompted significant changes in consumers' lifestyles, purchasing patterns, and work arrangements (Lingqvist *et al.* 2021; Fablus *et al.* 2020; Chenarides *et al.* 2021; Vyas and Butakhieo 2020; Rovetta 2021; Hakim, Zanetta, and da Cunha 2021). Adopting a social marketing perspective, implementing social distancing measures has influenced consumers' behavior by triggering psychological responses driven by the perceived threat and risk associated with the infectious disease (Chae 2021; Hakim,

Zanetta, and da Cunha 2021). For example, consumers have shown an increased inclination toward online grocery shopping (Chenarides *et al.* 2021), remote work arrangements (Vyas and Butakhieo 2020), and communication through social network platforms like WhatsApp and LINE (Chenarides *et al.* 2021).

Environmental Implications of COVID-19

COVID-19 has yielded both positive and negative environmental implications, as observed in previous studies (Rume and Islam 2020; Muhammad, Long, and Salman 2020; Lim *et al.* 2021; Wetchayont 2021). The positive effects encompass reductions in fossil fuel consumption, resource utilization, waste management, transportation, industrial activity, and demand for tourist destinations (Rume and Islam 2020). Conversely, the negative consequences involve challenges related to medical waste disposal, such as unplanned disposal of personal protective equipment (PPE), increased municipal waste generation, and a decline in recycling efforts (Rume and Islam 2020). Notably, during the COVID-19 lockdowns, there has been a discernible reduction in air pollution levels in Seoul, South Korea (Lim *et al.* 2021) and Bangkok, Thailand (Wetchayont 2021).

Research Gap and Objective

Previous research investigating the influence of environmental concerns on consumer behavior has highlighted various research contexts. These include the personal aspect, encompassing environmental knowledge and concern (Joireman and Durante 2016; Caniëls *et al.* 2021). The external aspect examines product packaging and corporate environmental responsibility (Joireman and Durante 2016; Caniëls *et al.* 2021). The human resource management practice/policy also explores environmental management and green technology (Schultz, 2001; Stern and Dietz 1994).

Within the realm of environmental concerns, researchers have examined the relationship between three dimensions: environmental egoistic, altruistic, and biospheric concerns and consumers' engagement in sustainable consumption. Sustainable consumption involves cognitive, affective, and conative attributes that enable consumers to avoid acquiring unnecessary products, guided by the Theory of Mind (Hilgard 1980, Quoquab and Mohammad 2020). Furthermore, sustainable consumption encompasses considerations for the well-being of future generations and takes into account the environmental, social, and economic consequences associated with the acquisition, use, and disposal of goods (Quoquab and Mohammad 2020; Hilgard 1980; Hwang and Yeo 2022; Kaur and Luchs 2022).

Two illustrative examples highlight the impact of consumers' environmental concerns on sustainable consumption (Hwang and Yeo 2022). In their study, Hwang and Yeo (2022) investigate the relationship between consumers' perceived value (functional, emotional, social, and altruistic) and sustainable consumption behaviors in South Korea. They focus on sustainable consumption behavior, particularly eco-label and recycled product purchases. The study's findings reveal that emotional value significantly influences the purchase of eco-labeled products, while both emotional and altruistic values play a role in influencing the purchase of recycled products.

Another study conducted by Kaur and Luchs (2022) measures sustainable consumption through two dimensions: (1) socially conscious consumption and (2) frugal consumption. Pepper, Jackson, and Uzzell (2009) developed the measurement scale for these dimensions. The research results indicate that egoistic, altruistic, and biospheric values influence socially conscious purchase behavior. In the context of frugal consumption in India, only altruistic values significantly influence purchase behavior.

This study aims to address two specific research gaps identified in the existing literature. The first research gap pertains to the absence of a direct examination of the relationship between an individual's egoistic, altruistic, and biospheric environmental concerns and their engagement in sustainable consumption behaviors, which can be measured through cognitive, affective, and conative aspects of sustainable consumption. While previous studies have explored the connection between egoistic, altruistic, and biospheric environmental concerns and sustainable consumption intentions, one study by Ayar and Gürbüz (2021) stands out as it considers consumers' sustainable consumption intentions concerning attitude, subjective norms, perceived behavior control, and altruistic value.

Furthermore, previous studies have not sufficiently identified which individuals are more likely to engage in prosocial consumption based on their environmental concerns. To bridge this gap, the present study adopts a comprehensive approach by examining consumers' environmental concerns, categorized into egoistic, altruistic, and biospheric concerns, and their influence on cognitive, affective, and conative dimensions of sustainable consumption.

The second research gap lies in the sampling methodology employed in previous studies, which often focused on collecting data from a single location, such as Turkey (Ayar and Gürbüz 2021), India (Kaur and Luchs

2022), South Korea (Hwang and Yeo 2022), Malaysia (Quoquab and Mohammad 2020), or Poland (Caniëls *et al.* 2021). To address this gap, the current study will include research samples from two distinct locations, specifically Taiwanese and Thai consumers, to assess their environmental concerns and sustainable consumption practices. This study aims to provide a more comprehensive understanding of the relationship between environmental concerns and sustainable consumption across different cultural and geographical contexts based on the Theory of Reasoned Goal Pursuit (TRGP) (Ajzen and Kruglanski 2019).

Research Question

This study investigates the correlation between environmental concerns and sustainable consumption among Taiwanese and Thai consumers, aiming to address existing literature gaps, especially post-COVID-19 lockdowns.

The research questions guiding the investigation are outlined below:

(1) To what extent do consumers' environmental concerns influence their engagement in sustainable consumption practices?

(2) Do sustainable consumption's cognitive and affective aspects mediate the relationship between egoistic, altruistic, and biospheric environmental concerns and conative sustainable consumption behaviors?

(3) Does the fear of COVID-19 moderate the association between environmental concerns and sustainable consumption behaviors?

(4) Are there discernible differences between Taiwanese and Thai consumers concerning their environmental concerns and the extent of their sustainable consumption practices?

Terminology

Environmental Concerns

The terminology, environmental concerns, adopts the definition from Wesley Schultz's description (2001). Schultz (2001) demonstrates that, according to the value-basis theory, consumer egoistic, altruistic, and biospheric toward environmental concerns result from more general underlying values, and different value orientations result in varied viewpoints. Therefore, Schultz (2001) defines environmental concerns as consisting of three dimensions: (1) egoistic (concern for the self concerning the environment), (2) altruistic (concern for other people concerning the environment), and (3) biospheric (concern for the biosphere). This study will adopt these variables of environmental concerns as independent variables.

Sustainable Consumption

The definition of sustainable consumption is based on work by Quoquab and Mohammad (2020). According to the Theory of Mind, consumers' sustainable consumption has been subdivided into (1) cognitive, (2) affective, and (3) conative sustainable consumption (Quoquab and Mohammad 2020, Hilgard 1980). The Theory of Mind explains how consumers comprehend behavior by examining their thoughts and wants (Quoquab and Mohammad 2020). Cognition is the mental state in which consumers gain knowledge and awareness of an object. Affective is the emotional state in which people develop feelings for or against an object. Conation refers to consumers' intentions and the probability of engaging in specific behaviors. Because the design of the research framework is based on the Theory of Reasoned Goal Pursuit (Ajzen and Kruglanski 2019), this study will utilize cognitive and affective sustainable consumption as mediating variables while conative sustainable consumption serves as the dependent variable.

Fear of COVID-19

The study will adopt the fear of COVID-19 scale from Ahorsu *et al.* (2022) and Lin *et al.* (2021) as a moderating variable. COVID-19 is hypothesized to be a factor in fear, stress, anxiety, and mood disorders to have physiological and psychological effects on consumers (Fawzy El-Bardan and Lathabhavan 2021).

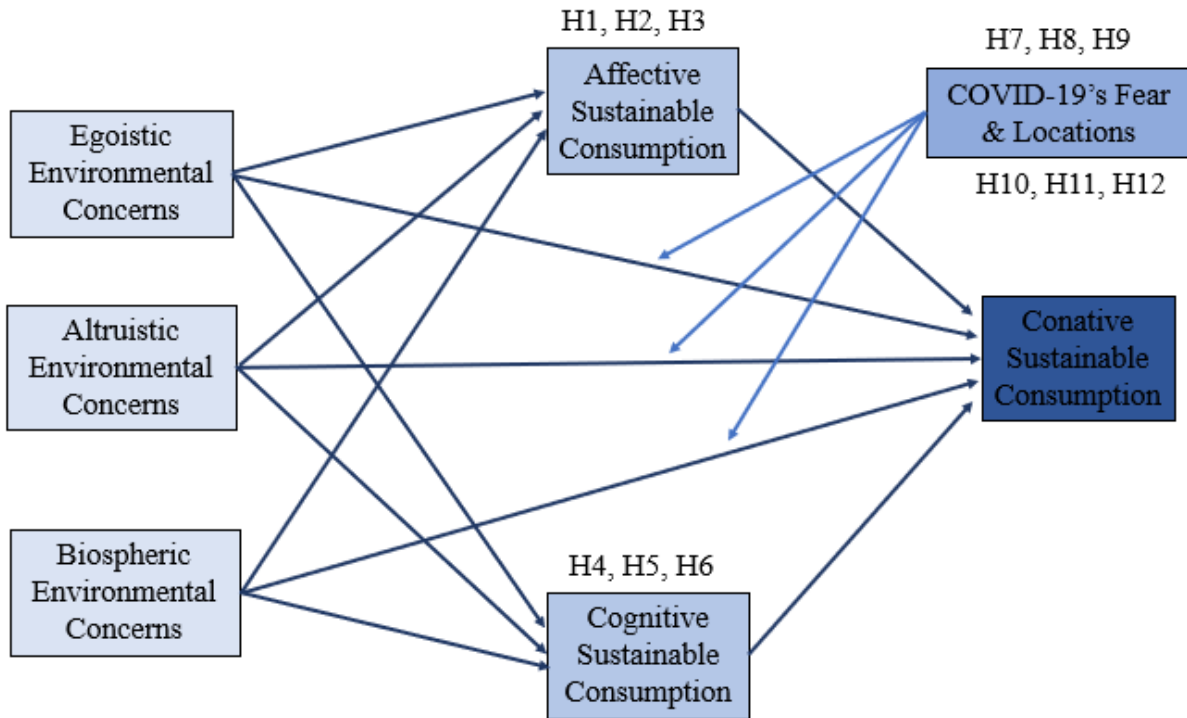
1. Literature Review

1.1. Conceptual Framework and Propositions

According to these four research questions above, the theoretical framework has been designed and developed based on the theory of Reasoned Goal Pursuit (TRGP) (Ajzen and Kruglanski 2019), as shown in Figure 1. The egoistic, altruistic, and biospheric environmental concerns are independent variables. The conative sustainable

consumption is the dependent variable. Furthermore, affective and cognitive sustainable consumption are mediating variables. On the other hand, the fear of COVID-19 and locations are moderating variables.

Figure 1. The Research Framework Design



1.2. Theoretical Framework: Theory of Reasoned Goal Pursuit

The theory of reasoned goal pursuit (TRGP) significantly explains and predicts consumers' social behavior and interventions to modify undesirable or desirable intentions and behaviors (Ajzen and Kruglanski 2019). The TRGP has integrated these two theoretical perspectives: the theory of planned behavior (TPB) and goal systems theory (GST) (Ajzen and Kruglanski 2019). TPB is a commonly utilized behavior-centered theory for predicting and modifying human behavior (Ajzen 2012, 1991). According to the TPB, attitude, subjective norm, and perceived behavioral control lead to intention for each behavior option. On the other hand, GST is goal-focused (Kruglanski *et al.* 2002). The goal indicates that active procurement and approval goals are an action to influence motivation.

The following describes the TGRP variable's interactive relationship (Ajzen and Kruglanski 2019):

(1) The intention is the immediate cause of the behavior. Furthermore, actual behavioral control moderates the relationship between intention and behavior.

(2) It can be used to evaluate actual behavioral control only when perceived behavioral control accurately reflects actual behavioral control.

(3) The intention is determined by attitude toward the behavior, subjective norms, and perceived behavioral control.

(4) Behavioral belief determines attitude; normative belief determines subjective norm; control belief determines perceived behavioral control.

(5) Motivation has been affected by attitudes and subjective norms to engage in the intention, which turns into a behavior.

(6) Perceived behavioral control moderates the relationship between motivation and intention.

(7) Active procurement and approval goals directly influence attitudes and subjective norms.

(8) The influence of subjective norms on the motivation to engage in a behavior is moderated by the active procurement and approval goals.

For example, Hamilton *et al.* (2022) applied the TRGP model to explore the correlates of physical activity among Australian undergraduate students during the COVID-19-induced lockdown. Their results reaffirmed the efficacy of TRGP constructs, pinpointing beliefs, goals, and cognitive-affective strategies as significant predictors of physical activity. Emphasizing the salience of discerning behavioral influences during unprecedented

scenarios like the COVID-19 lockdown, their research posited the TRGP as a potent framework for sculpting interventions fostering physical activity.

Similarly, Concarì *et al.* (2023) investigated a consumer's willingness to participate in recycling schemes, employing the TRGP framework. Their findings accentuated the pivotal role of attitudes, subjective norms, and perceived behavioral control, with active goals as mediators. A key takeaway was the imperative of meticulous active goal analysis, complemented by acknowledging the intrinsic limitations of questionnaires.

Therefore, this study develops the theoretical framework regarding TRGP, as shown in Figure 1. The study hypothesizes that consumers with active environmental protective procurement and approval goals have environmental protection-related procurement and approval objectives. Furthermore, the impact of environmental concerns on both aims has altered their attitudes and subjective norms. In other words, egoistic, altruistic, and biospheric concerns about the environment are examined in the study to realize how they influence consumers' conative sustainable consumption in terms of their affective and cognitive sustainable consumption.

1.3 Environmental Concerns and Sustainable Consumption

Environmental concerns indicate that consumers are more aware of and concerned about the environmental impact of their consumption decisions: consumption intention, green purchase intention, or pro-environmental behavior. For example, the study by Hwang and Yeo (2022) utilizes the actual behavior of sustainable consumption, as measured by purchasing eco-label and recycled products. Their findings suggest that emotional and altruistic values influence (1) the purchase of eco-labeled products and (2) the purchase of recycled products. Specifically, environmental awareness affects environmental concerns, which turn into sustainable consumption (Zameer and Yasmeen 2022). Also, Kaur and Luchs's (2022) study indicates that egoistic, altruistic, and biospheric values influence socially conscious purchase behavior. Only altruistic values influence frugal purchase behavior.

Furthermore, environmental concerns, including environmental awareness and knowledge, assume egoistic environmental concerns, reflecting an individual's self-value (Miftari *et al.* 2022; Zameer and Yasmeen 2022; Caniëls *et al.* 2021). Specifically, because of environmental concerns, consumer attitudes toward organic foods significantly impact consumption intention (Miftari *et al.* 2022). However, egoistic, altruistic, and biospheric values influence socially conscious purchase behavior in the study of Kaur and Luchs (2022). Moreover, altruistic environmental concerns affect sustainable consumption behavior (Hwang and Yeo 2022). Biospheric environmental concerns predict consumers' sustainable patterns (Caniëls *et al.* 2021). Numerous pieces of literature conclude that consumers' value of environmental concerns affects their sustainable consumption, including intention or behavior. Furthermore, consumption means (1) what consumers purchase and how much consumers pay (Kaur and Luchs 2022)

On the other hand, from the view of the prosocial consumer, prosocial consumers regard consumer behavior as conflicting. Purchasing goods or services for one's benefit is considered consumer self-interest (Small and Cryder 2016; White, Habib, and Dahl 2020). Global warming, climate change, and environmental protection have changed consumer behavior (Widayat *et al.* 2022), including consumers' pro-environmental behavior, such as avoiding plastic bags (Widayat *et al.* 2022). Therefore, green or sustainable marketing makes consumers prosocial (Small and Cryder 2016; White, Habib, and Dahl 2020; Widayat *et al.* 2022; Wong and Tzeng 2019).

To identify who will be prosocial consumers, this study utilizes the definitions of environmental concerns by Schultz (2001) and sustainable consumption by Quoquab and Mohammad (2020). Therefore, the independent variables are (1) egoistic, (2) altruistic, and (3) biospheric environmental concerns. The independent variable is conative sustainable consumption. The cognitive and affective sustainable consumption are mediating variables.

These hypotheses are summarized below,

H1: Affective sustainable consumption mediates the relationship between egoistic environmental concerns and conative sustainable consumption.

H2: Affective sustainable consumption mediates the relationship between altruistic environmental concerns and conative sustainable consumption.

H3: Affective sustainable consumption mediates the relationship between biospheric environmental concerns and conative sustainable consumption.

H4: Cognitive sustainable consumption mediates the relationship between egoistic environmental concerns and conative sustainable consumption.

H5: Cognitive sustainable consumption mediates the relationship between altruistic environmental concerns and conative sustainable consumption.

H6: Cognitive sustainable consumption mediates the relationship between biospheric environmental concerns and conative sustainable consumption.

1.4 COVID-19's Fear, Environmental Concerns, and Sustainable Consumption

From the insight of social marketing, since 2020, the COVID-19 pandemic has been changing consumers' behavior, such as purchasing, working, and learning (Chae 2021; Vyas and Butakhieo 2020; Sun *et al.* 2021; Hakim, Zanetta, and da Cunha 2021) and environmental effects (Lim *et al.* 2021; Muhammad, Long, and Salman 2020; Khan *et al.* 2020; Wetchayont 2021). For example, the study of Hakim, Zanetta, and da Cunha (2021) indicates that the desire to visit a restaurant during the COVID-19 pandemic is predicted by consumers' faith in restaurants and brands, reasonable prices, disease denial, and health surveillance trust in Brazil.

On the other hand, the COVID-19 pandemic is a significant factor in modifying consumer behavior, reflecting environmental concerns and sustainable consumption (Severo, De Guimaraes, and Dellarmelin 2021; Dangelico, Schiaroli, and Fraccascia 2022; Leal Filho *et al.* 2022). The COVID-19 pandemic impacted sustainable consumption the most, followed by environmental concerns and social responsibility (Severo, De Guimaraes, and Dellarmelin 2021). For example, in the study by Jian *et al.* (2020), COVID-19 has raised consumers' environmental concerns and trust in green hotel brands, boosting their willingness to spend more.

Consumers have increased their purchase frequency and willingness to pay for sustainable products, show growing attention to environmental concerns, and behave more sustainably. Consumers have increased their purchase frequency and willingness to pay for sustainable products, show growing attention to environmental issues, and act more sustainably (Dangelico, Schiaroli, and Fraccascia 2022). Specifically, the COVID-19 pandemic positively influences sustainable consumption (Severo, De Guimaraes, and Dellarmelin 2021).

The degree to which individuals were prepared to acquire green and sustainably produced goods during the second wave of the COVID-19 pandemic (Leal Filho *et al.* 2022). Leal Filho *et al.* (2022) and Dangelico, Schiaroli, and Fraccascia (2022) find that the COVID-19 pandemic presented a chance to encourage sustainable consumption. Positive and statistically significant impacts are exhibited by ecological awareness, habit, and occasional pro-environmental behavior (Leal Filho *et al.* 2022). The occasional pro-environmental behavior indicator has the most significant positive impact on the likelihood of highly sustainable consumption behavior (Leal Filho *et al.* 2022).

Specifically, consumers' sustainable consumption of consciousness and ecological and social factors were affected by the COVID-19 experience (Huttel and Balderjahn 2021). When sustainability-conscious consumers' ecological, social, and voluntary simplicity consciousness decreases, it significantly affects their willingness to spend sustainably and their purchasing choices (Huttel and Balderjahn 2021). The main reason is that the COVID-19 pandemic raised consumers' perceptions of the threat, resulting in a decline in sustainable items compared with nonsustainable products (Chae 2021).

Therefore, this study adopts the fear of COVID-19 as a moderating variable. The hypotheses are the following.

H7: The fear of COVID-19 moderates the relationship between egoistic environmental concerns and conative sustainable consumption.

H8: The fear of COVID-19 moderates the relationship between altruistic environmental concerns and conative sustainable consumption.

H9: The fear of COVID-19 moderates the relationship between biospheric environmental concerns and conative sustainable consumption.

On the other hand, this study will collect research samples from Taiwan and Thailand. Because of that, two groups of participants compare different paths between environmental concerns and sustainable consumption. These hypotheses are below,

H10: Taiwanese consumers' egoistic environmental concerns and conative sustainable consumerism differ from Thai consumers.

H11: Taiwanese consumers' altruistic environmental concerns and conative sustainable consumerism differ from Thai consumers.

H12: Taiwanese consumers' biospheric environmental concerns and conative sustainable consumerism differ from Thai consumers.

2. Methodology

2.1 Sampling

This study will target a research sample who experienced delivery services in Taipei, Taiwan, and Bangkok, Thailand. There are two reasons. First, these consumers must place their orders via retail websites, online platforms, or mobile applications to utilize delivery services. These consumers are, therefore, Internet or WIFI users. Second, during the COVID-19 pandemic, consumers avoid places of commerce such as restaurants, supermarkets, and shopping malls. Specifically, during the COVID-19 lockdown, consumers only have two choices: pick up or use delivery services.

In other words, the research samples will be collected from the population of Internet or WIFI users, namely, online consumers. Furthermore, they must adopt a delivery service for online purchases. Consequently, the questionnaire will be distributed online using the sample database of professional market research firms in both locations.

2.2 Instrument

The instrument will initially be developed in English and refer to the constructs of (1) egotistic, altruistic, and biospheric environmental concerns from Wesley Schultz (2001), (2) cognitive, affective, and conative sustainable consumer from Quoquab and Mohammad (2020), and (3) fear of COVID-19 from Ahorsu *et al.* (2022) and Lin *et al.* (2021).

In the second step, experienced instructors in Taiwan and Thailand will translate the English questionnaire into Mandarin and Thai. Mandarin and Thai are both widely spoken in each respective country. Respondents will complete the questionnaire within 10 to 15 minutes.

In order to collect validity and reliability of data, the introduction will contain one statement to assess respondents' understanding of delivery services: "The delivery service is the act of ordering specific products through home delivery, such as takeaway, grocery, beverage, errands to run, fresh meals, fast-moving consumer goods (FMCG), etc." The respondents will be required to indicate whether they understood the delivery service. Responses of "yes" and "no" were provided for the following question: "Do you understand the meaning of delivering services?" Respondents who answered "no" will be excluded from the study.

The instrument will be designed in three sections. The first section regards consumers' delivery services usage behavior. Four questions, as shown in Table 1 in the appendix, measure the frequency of consumers using delivery services last week. The number of behavioral measurements divided into (1) less than 2 times; (2) 3 to 4 times; (3) 5 to 6 times; (4) 7 to 8 times; (5) 9 to 10 times; (6) 11 to 12 times; (7) More than 13 times.

The second section contained 36 items, as shown in Appendix, Table 1. (1) environmental concerns are comprised of egoistic concern (four items), altruistic concern (four items), and biospheric concern (four items); (2) sustainable consumption consists of cognitive (six items), affective (six items), and conative sustainable consumption (six items). The fear of COVID-19 consists of six items. The respondents were required to provide their responses on a seven-point Likert scale, with one indicating "strongly disagree" and seven indicating "total agreement."

In the third section, respondents were required to provide information about their gender, age, education level, marital status, monthly income, and living location (city).

2.3 Data Analysis Process

This study will utilize Structural Equation Modeling (SEM) to examine the measurement model and estimate the structural coefficients via SmartPLS software. Chin (1998) illustrates how SEM can be used (1) to examine the correlation between multiple predictors and criterion variables statistically, (2) to construct unobservable latent variables, (3) to analyze measurement errors for observed variables, and (4) to statistically examine the correlation between previous substantive and empirical data measurement assumptions.

The SEM procedure of this study will consist of five steps (Baron and Kenny 1986; Chin, 1998; J. F. Hair *et al.* 2019; Joseph F. Hair *et al.* 2019; MacKinnon *et al.* 2004; McDonald and Ho, 2002; Sarstedt *et al.* 2017). First, the study will use the CFA to examine the validity and reliability of the measurement model. Second, the study will employ a path analysis to examine hypotheses through the structural model. Third, from hypotheses one to six, the study will use bootstrapping to analyze the mediation effect of consumers' cognitive and affective sustainable consumption. Fourth, the bootstrapping approach will examine whether fear of COVID-19 moderates the relationship between consumers' cognitive, affective, and conative environmental concerns and their cognitive, affective, and conative sustainable consumption from Hypotheses seven to nine. Fifth, the study will

adopt bootstrapping multi-group analysis (MGA) to analyze the difference between Taiwanese and Thai groups from hypotheses 10 to 12.

Conclusion

This study has two main objectives: (1) to examine how consumers' egoistic, altruistic, and biospheric environmental concerns influence their cognitive, affective, and conative sustainable consumption and (2) to focus on consumers who experienced the COVID-19 lockdowns and utilized delivery services in Taipei, Taiwan, and Bangkok, Thailand. The study is motivated by two primary considerations: (1) examining if sustainable consumption patterns differ among consumers from various locations post-COVID-19 pandemic and (2) assessing whether COVID-19 fear moderates the relationship between environmental concerns and sustainable consumption in Taiwan and Thailand.

Therefore, by analyzing the relationship between these environmental concerns and sustainable consumption, the study aims to identify and understand prosocial consumers. The anticipated results of this research are expected to make the following contributions:

(1) From an academic perspective, the study will provide valuable insights into the direct influence of consumers' environmental concerns on their sustainable consumption behaviors, specifically after the experience of COVID-19 lockdowns. The study will contribute to a clearer understanding of the factors driving sustainable consumption in the context of significant disruptions such as a pandemic.

(2) From a business standpoint, the study is expected to identify effective strategies for offering green products to consumers and promoting environmental concerns, which can, in turn, impact consumers' attitudes and behaviors related to sustainable consumption, including their purchase intentions and actual consumption patterns. This valuable information will aid businesses in developing targeted marketing and communication strategies to foster more sustainable consumer behaviors and preferences.

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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.

Credit Authorship Contribution Statement

Wong Ming Wong: Dr. Wong, as the first and corresponding author, spearheaded the study's conceptualization, methodology, and investigation. He led the formal analysis and oversaw the project's administration while securing funding. Furthermore, he was instrumental in crafting the manuscript, overseeing its review, editing, and final visualization.

MingJing Qu: Holding the second author position, Dr Qu was instrumental in refining the study's conceptual framework and enhancing the manuscript through meticulous proofreading and insightful feedback.

Chanidapha Nunualvuttiwong: As the third author, Ms. Nunualvuttiwong holds a significant role in the research project team. She translated the questionnaire between English and Thai. Furthermore, her strategic approach was vital in professionally distributing the questionnaire to the targeted research sample.

Kobkullaya Ngamcharoenmongkhon: Collaborating as a linguistic specialist, Dr Ngamcharoenmongkhon facilitated the translation of research materials and actively distributed the questionnaire to the designated sample.

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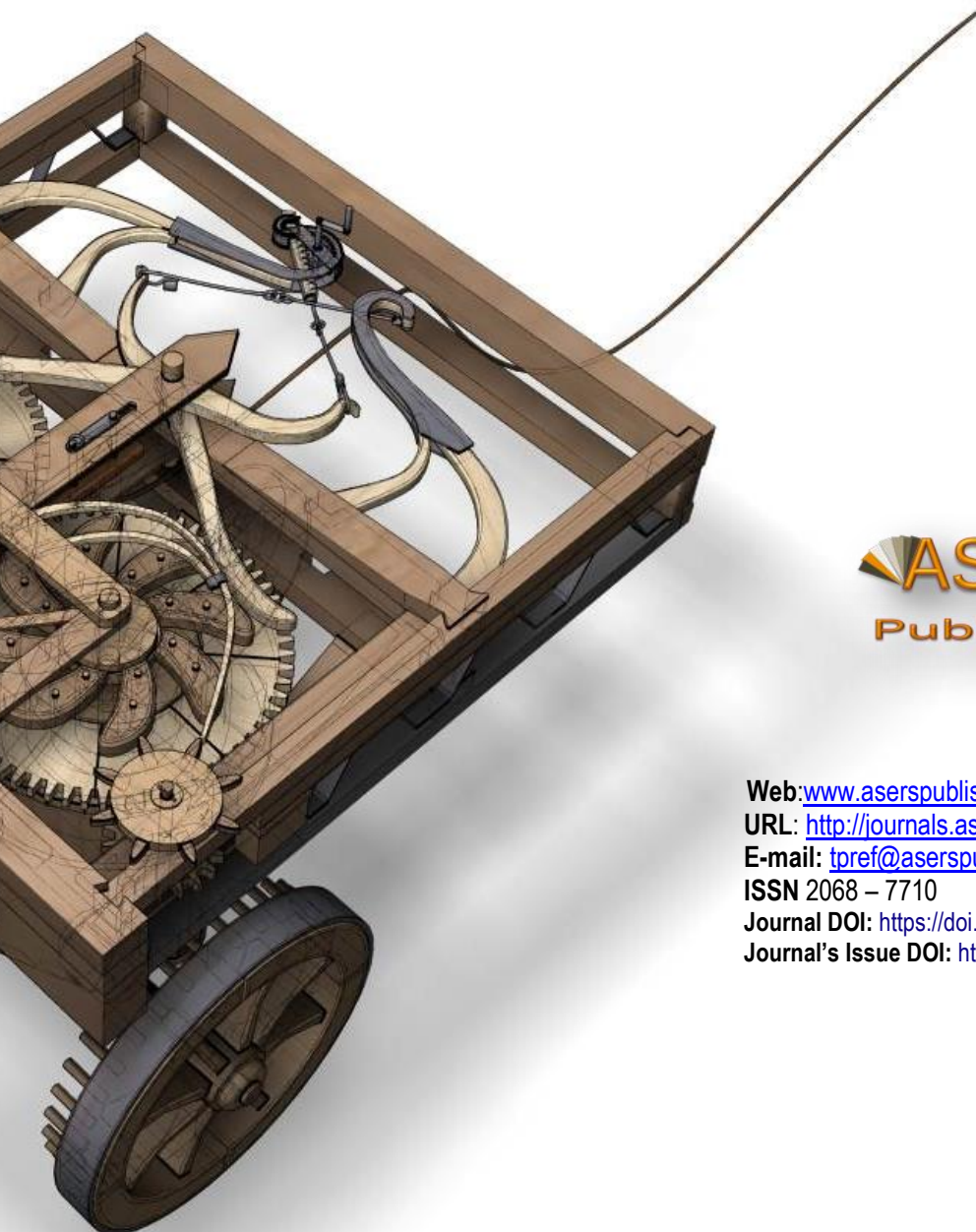
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Appendix

Table 1. Constructs and scale items of the instrument

Construct		Scale Item
Delivery Services Usage Behavior	1	I have used the foods delivery service in the past week is
	2	I have used the beverages delivery service in the past week is
	3	I have used the groceries delivery service in the past week is
	4	I have used the online shopping purchase delivery service in the past week is
Egotistic Environmental Concern	1	I am concerned that environmental issues will seriously impact me personally.
	2	I am concerned that environmental issues will seriously impact my lifestyle.
	3	I am concerned that environmental issues will seriously impact my health.
	4	I fear environmental concerns will seriously impact my future.
Altruistic Environmental Concern	1	I am concerned that environmental problems will seriously impact the people of our country.
	2	I am concerned that environmental issues will seriously impact everyone.
	3	I am concerned that environmental issues will seriously impact children.
	4	I am concerned that environmental issues will seriously impact our children.
Biospheric Environmental Concern	1	I am concerned that environmental issues will seriously impact plants.
	2	I am concerned that environmental issues will seriously impact marine life.
	3	I am concerned that environmental issues will seriously impact birds.
	4	I am concerned that environmental issues will seriously impact animals.
Cognitive Sustainable Consumption	1	I think wasting food and other consumables is unethical.
	2	I realized that overconsumption leads to a shortage of natural resources.
	3	I think it is essential to use eco-friendly products.
	4	Individuals should be concerned about the environment where the next generation lives.
	5	I think it is our responsibility to care for the natural environment.
	6	I know that natural resources are dwindling at an alarming rate.
Affective Sustainable Consumption	1	I felt good when I could control the need to buy non-essential goods.
	2	I would not say I like to waste food.
	3	I prefer to buy organic food because they are environmentally friendly.
	4	I am more motivated to spend more money on eco-friendly products.
	5	I prefer to use paper-material bags because they are biodegradable.
	6	I will only buy what I need.
Conative Sustainable Consumption	1	I intend to reduce the waste of resources (for example, when I am not in the room, I turn off the lights and fans).
	2	I will continue to buy eco-friendly products, even if they are slightly more expensive.
	3	I will avoid consumption behaviors that may cause environmental pollution.
	4	I will continue buying biodegradable packaging (e.g., paper bags instead of plastic bags).
	5	I will maintain on not wasting my food as much as possible.
	6	In the future, I will continue to contribute to the environment in all aspects.
Fear of COVID-19	1	Now I am most afraid of getting COVID-19.
	2	When I think about the coronavirus, I feel overwhelmed.
	3	I am worried about losing my life due to COVID-19.
	4	I get worried when I see news about the coronavirus on social media.
	5	I will lose sleep because I am worried about the new crown virus.
	6	When I think about it, my heart beats faster if I'm infected with COVID-19.

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