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Consequences of Psychological Benefits in the Context of Eco-Friendly Indoor Smart Farm Restaurants: The Moderating Role of Curiosity

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Abstract: This study was designed in order to understand the psychological benefits of an indoor smart farm restaurant, which is a restaurant that operates a smart farm inside the restaurant. The study more specifically proposes a conceptual framework that includes psychological benefits, attitudes, and future engagement. In addition, this study investigated whether the impact of psychological benefits on attitude is moderated by curiosity. The data was collected from 317 participants in South Korea. The results revealed that warm glow, nature experiences, and self-expressive benefits positively influenced attitude. Also, attitude, warm glow, and self-expressive benefits significantly affected future engagement. Lastly, the effect of psychological benefits on attitudes is moderated by curiosity.

Keywords: indoor smart farm restaurant; psychological benefit; attitude; future engagement; curiosity



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1. Introduction

The shift towards sustainable agriculture from conventional agriculture by using smart farms is becoming important, which is due to global warming, environmental pollution, and the growth of the global population [1,2]. Smart farms are regarded as a disruptive innovation that efficiently produces agricultural products with an IoT-based automation system [3,4]. Moreover, smart farms contribute to environmental protection by reducing greenhouse gas emissions compared to conventional agriculture, which causes climate change due to the emissions of soil carbon [5,6]. They are also exemplary in terms of green growth, which is due to their high economic efficiency and profitability [7,8]. Numerous researchers have consistently suggested urban farming using smart farms for sustainable environmental protection and as a food supply for these reasons [9,10]. This trend is also emerging in the foodservice industry, such as with an indoor smart farm restaurant (ISFR), which is a new type of restaurant that uses smart farms. For instance, *Farm Eight* in South Korea built smart farms in its flagship store, and it provides menu items, such as salads, sandwiches, and juice, which are made from agricultural ingredients from its smart farms [11]. Food Inspiration [12] reported cases of restaurants that used smart farms, such as *Farmers and Chefs* in New York and *Weilands* in Berlin. In addition, *The London Essence Company*, which is a beverage brand, built an entire back bar with smart farms in its pop-up at the London cocktail week festival [13]. They provided a beverage/cocktail menu using herbs from smart farms as ingredients or garnishes. However, the empirical studies on ISFRs are insufficient in spite of this global trend.

The hospitality sector is partly accountable for environmental protection because it uses inefficient energy, water, and disposables [14,15]. In particular, restaurants are the largest energy user and emit approximately 490 tons of CO₂ produced per restaurant every year [16,17]. There have been moves to persuade management in the hospitality industry that green management contributes to both a successful business and environmental

protection [18–20]. The trend of green consumerism has also promoted green practices in the hospitality sector such as green restaurants and hotels [16,21,22].

More importantly, such green consumption can provide psychological benefits because it contributes to environmental protection [23]. Sweeney and Webb [24] (p. 476) defined the psychological benefits as “feelings of trust or confidence in the other party that result in greater peace of mind.” For instance, when the consumers visit ISFRs, they can feel the psychological benefits due to its eco-friendly roles. Numerous researchers have studied the effect of the psychological benefits in order to predict the consumers’ pro-environmental behavior [23,25,26]. Psychological benefits in particular play an essential role in regard to forming a positive attitude toward an eco-friendly product/service, which in turn leads to pro-environmental behavior, such as purchasing or using eco-friendly products [27–29]. For instance, Hwang and Kim [28] adopted this concept in the context of environmentally friendly insect restaurants. Kim et al. [29] also applied this concept in order to predict intentions to purchase home meal replacement products using eco-friendly broadcasting home shopping. These three studies found that psychological benefits positively influence attitudes in regard to consumers’ decision-making and lead to consumer behavior. There are no prior studies that focus on the concept of psychological benefits in the context of ISFRs.

Joo et al. [30] pioneeringly investigated consumer behavior in the ISFR context. They captured the consumers’ pro-social motives, in which the awareness of the problem of environmental pollution evokes responsibility, which in turn influences the personal norms of using ISFRs. It also revealed self-interest motives, such as the link between attitudes and intentions to visit and the link between perceived behavior and intentions to visit. However, the study cannot capture consumer behavior that is fostered by the merits of products, such as the psychological benefits of eco-friendly ISFRs. The present study adopted the concept of psychological benefits in the context of ISFRs and investigated their consequences due to this research gap.

Furthermore, curiosity is a crucial element in regard to predicting consumer behavior in the hospitality sector [31–33]. For instance, Lin and Mattila [34] found the impact of curiosity on switching intentions in the context of restaurants. Kuo et al.’s [35] study states that curiosity has provided positive impressions of new technology-based services. Meanwhile, recent studies emphasized the important role of curiosity as a moderator in consumer behavior [36–38]. The information gap theory states that curiosity is caused by the gap in knowledge about new things [39], and it relates to the desire for new experiences [40,41]. Curious people are willing to try new experiences with uncertain outcomes, and they respond positively to new things [42,43]. Likewise, curiosity also interacts with positive emotions, so it may affect the evaluation of a product [44–46]. For example, Arif et al. [36] discovered that the impact of perceived interactivity on satisfaction was strengthened by curiosity in e-commerce consumer behavior. It can be inferred that curiosity strengthens the relationship between the positive benefits of products/services and the consumers’ responses. As a result, this paper investigated whether the effect of the psychological benefits on attitude is moderated by curiosity.

In summary, this study focused on the concept of psychological benefits and its consequences in regard to the ISFR was investigated for the first time in order to fill the acknowledged research gap. The objectives of this paper include the following items below.

1. Examine the impacts of the psychological benefits on attitude toward ISFRs.
2. Demonstrate the causal link between attitude and future engagement.
3. Investigate whether the link between psychological benefits and attitude is strengthened by curiosity.

The research model, which is based on the presented objectives, is shown in Figure 1. This study presents theoretical extensions by bridging the acknowledged research gaps, and it provides practical suggestions in regard to commercializing ISFRs.

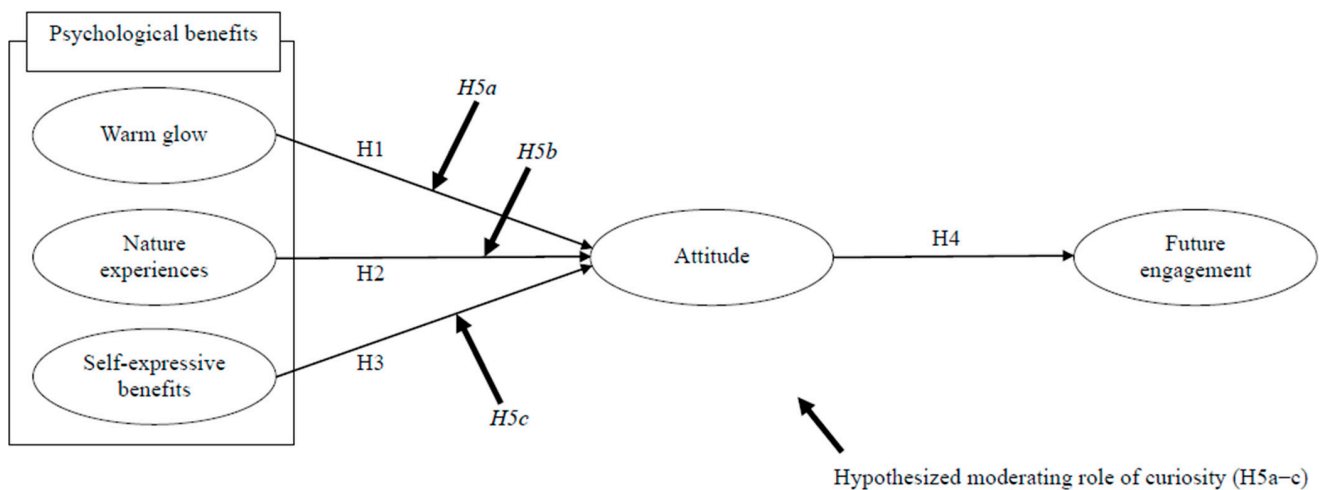


Figure 1. Research model.

2. Literature Review

2.1. ISFR as a Green Restaurant

Smart farms, which are agriculture systems that use IoT solutions, have many strengths, such as a higher productivity per area and labor efficiency [3,47]. Smart farming also enables the management of consistent quality and prices with stable productivity, because it is safe from pests and natural disasters [48]. Thus, the economic and efficient qualities of smart farms are being highlighted in the market, and agricultural products from smart farms are expected to be continuously distributed to the consumers [49]. In addition, conventional agriculture causes climate change due to the emissions of soil carbon, but smart farms aid by helping with environmental protection by reducing greenhouse gas emissions [5,6]. Conventional agriculture also causes the acidification and eutrophication of land, which is due to pesticides and fertilizers [50,51]. For these reasons, the shift toward smart farming from conventional agriculture is becoming more important [1,2]. Ali et al. [9] and Musa et al. [10] also suggested urban farming using smart farms is necessary for sustainable environmental protection. This trend is also emerging in the foodservice industry, such as with *Farm Eight* in Korea, *Farmers and Chefs* in New York, and *Weilands* in Berlin [11,12]. These types of ISFRs are a new type of restaurant that applies smart farms, and they provide menus that use self-supplied agricultural ingredients from their smart farms in the stores. The empirical studies on ISFRs are insufficient in spite of this global trend.

A green restaurant is a restaurant that implements environmentally friendly ways to reduce the negative influence of its operations on the environment [52,53]. Green restaurants generally contribute to environmental protection by using energy/water-efficient equipment, preparing menu items with green/organic ingredients, reducing the carbon footprint, and forbidding disposable cups/to-go containers [54,55]. Smart farms can reduce greenhouse gas emissions and avoid the acidification and eutrophication of land due to pesticides and fertilizers [5,6,50,51], so ISFRs can contribute to environmental protection as a green restaurant. These types of environmentally friendly benefits are an important factor that affects consumer decisions in green restaurants [55–57]. For instance, Wang et al. [58] discovered that consumers' green cognition evoked from restaurants' green marketing significantly influences the restaurant image and purchase intention. Namkung and Jang [59] also reported that customers are more likely to pay extra money for using green restaurants. Chaturvedi et al. [60] discovered that if consumers perceive restaurants' green practices, it positively influences satisfaction, which in turn impacts intentions to revisit. Thus, studying the eco-friendly aspect of ISFRs is meaningful in regard to predicting consumer behavior.

2.2. Psychological Benefits from ISFRs

The concept of psychological benefits, which is defined by Sweeney and Webb [24], refers to a sense of trust/confidence in the other party that ultimately brings about an increased peace of mind. The consumers feel psychological benefits from a green product because of its eco-friendly role [23]. It also has important meaning from the perspective of green purchases [29,61], which means that if consumers purchase a particular green product, they will feel peace of mind due to its eco-friendly role. Kushwah et al.'s [62] study showed that people can feel psychological benefits when they behave pro-environmentally, such as by purchasing either organic or eco-friendly items. Hartmann and Apaolaza-Ibáñez [23] proposed the three multi-dimensions of this concept, which included a warm glow, nature experiences, and self-expressive benefits. They proposed these dimensions as predictors of the consumers' attitudes and intentions to use in order to investigate ways to increase the consumer demand for green energy. They discovered that warm glow positively affected purchase intentions, and nature experiences influenced brand attitude. Numerous subsequent studies applied these three sub-dimensions in green research [25,28,29].

The first sub-dimension of psychological benefit is a warm glow, which means moral satisfaction from public interest, such as contributing to environmental protection [63]. The consumers can experience the psychological benefit of a warm glow while indulging in environmentally friendly behaviors [64]. Nunes and Schokkaert [65] stated that the consumers' ethical benefits from environmental protection can evoke feeling a warm glow. A warm glow is instigated by pursuing to help others or nature voluntarily, so consumers are more likely to use green products [66]. Moreover, Hartmann et al. [67] argued that a warm glow strengthens the effect of pro-environmental behavior. For instance, Hwang et al. [68] discovered the effect of a warm glow from an environmentally friendly drone service on positive anticipated emotions and behavior intention. Chan et al. [25] also examined that a warm glow from eco-friendly airlines is positively related to the corporate image.

The second sub-dimension is nature experiences. This is an essential element of psychological benefits, because the consumers want to be with nature in order to heal their minds [23,68]. If people spend a sufficient amount of time with nature, they will experience an improved quality of life [69]. Hartmann and Apaolaza-Ibáñez [23] argued that the images of the natural environment aid in regard to enhancing the importance of green product features. People with a lot of nature experiences are also more likely to show pro-environmental behaviors [70]. Mayer et al. [71] also argued that nature experiences affect pro-environmental behaviors, such as green purchases. For example, Chen and Lee [72] explain the nexus between nature experiences and eco-friendly behavior in the field of online food delivery services. Kim et al. [29] identified that nature experience influences attitude toward eco-friendly broadcasting home shopping.

The last sub-dimension is self-expressive benefits, which means the benefits people derive from expressing concerns about environmental issues to others [23]. The signaling theory states that people tend to implicitly propagate information about themselves by expressing their preferences or traits [73,74]. According to the self-congruity theory by Sirgy [75], people want to purchase products that are congruent with their image. In other words, people express their traits by purchasing products that match their image, which in turn leads to self-expressive benefits [76]. The previous studies regarded self-expressive benefits as a crucial variable in regard to consumer behavior [26,28]. For instance, the consumers' attitudes toward eco-friendly entomophagy restaurants are positively associated with their self-expressive benefits [26]. Policarpo and Aguiar [28] also discovered that the self-expressive benefits of using an eco-friendly hybrid car positively affect both perceived values and purchase intentions.

The psychological benefit is an important variable in regard to predicting the consumers' pro-environmental behavior, which is identified by the literature above. ISFRs also contribute to sustainable environmental protection, so it is necessary to apply this concept in the context of ISFRs. For instance, when consumers visit ISFRs, they can per-

ceive psychological benefits, such as a warm glow, a nature experience, and self-expressive benefits, which are due to its eco-friendly roles. The present study applied these three multi-dimensions of psychological benefits, which is based on the discussion above.

2.3. The Causal Relationship between Psychological Benefits and Attitude

Attitude is defined as the degree of positive/negative or favorable/unfavorable feelings toward a particular behavior [77,78], and it is regarded as the psychological tendency to evaluate a specific entity [79]. The concept of attitude also corresponds to the motivation for human behavior [80,81]. Numerous researchers identified relations between attitudes and behaviors [82,83]. Attitude significantly affects consumer behavior, so the previous studies investigated its antecedents and consequences [84–87]. The present study suggests a framework that includes the causal relationship between psychological benefits and attitudes, which is grounded in the following theoretical and empirical evidence.

Brouwer et al. [88] argued that attitudes toward pro-environmental behavior originated from the outcome of contributing to the public interests in environmental protection. This is in line with the concept of a warm glow, because the warm glow of environmental protection makes the consumers feel good [64]. This means that the expectation of a warm glow potentially motivates the attitude formation toward products [23]. A warm glow influences the positive attitude toward purchasing green products from the perspective of ethical consumption [89]. Hence, the consumers can have favorable attitudes toward ISFRs when they perceive a sense of a warm glow. For example, a warm glow can evoke attitudes in the environmentally friendly home shopping context [29]. Thus, the current study postulated the first hypothesis as follows.

Hypothesis 1 (H1). *Warm glow positively influences attitude.*

Second, according to the psychology of the environment, nature experiences evoke positive emotional responses [90]. These types of positive emotional responses lead to the attitudes toward the products [91]. Nature experiences also positively influence the evaluative aspects, such as attitudes [70]. Purchasing green products more importantly corresponds to the nature experience, because it makes the consumers feel close to nature through contributing to environmental protection [23,29]. It can be inferred that nature experiences would aid in regard to enhancing the consumers' positive attitudes toward purchasing green products. Hwang and Kim [28] discovered that nature experience in eco-friendly edible insect restaurants positively affects the attitude toward the restaurant. Also, nature experiences that are provided by eco-friendly ISFRs will have a positive effect on attitudes. Thus, the current study postulated the second hypothesis as follows.

Hypothesis 2 (H2). *Nature experiences positively influence attitude.*

Third, people tend to choose a particular product in order to express their attitudes/values, which in turn leads to self-expressive benefits [76,92]. People can perceive the self-expressive benefits when purchasing green products, because it represents their environmental concern and eco-friendly traits [26]. These types of self-expressive benefits by purchasing green products foster positive responses [76]. For example, Boobalan et al. [27] identified the positive impact of self-expressive benefits on attitude when purchasing organic foods. They stated that organic food is regarded as an eco-friendly product, so consumers can reflect a positive social image of themselves, which fosters the attitude toward the product. ISFRs contribute to environmental protection, which was previously explained, so consumers can perceive self-expressive benefits that will influence positive attitudes. Thus, the current study postulated the third hypothesis as follows.

Hypothesis 3 (H3). *Self-expressive benefits positively influence attitude.*

2.4. The Concept of Future Engagement and the Link with Attitude

Future engagement is a willingness to use a particular product or to engage in a specific activity in the future [93,94]. This concept is regarded as a crucial element in consumer marketing, which is due to reducing the decision ambivalence [95,96]. Positive values of either products or services lead to future engagement usage [93,97]. For example, Ong et al. [98] investigated the product awareness of coconut flour in Indonesia, and the consumers' decision to purchase healthy products plays a significant role in regard to forming future engagement. In addition, future engagement is also influenced by consumer evaluation [99]. Mahadevan [100] demonstrated the positive impact of satisfaction on future engagement in the sports events context. Future engagement can be fostered by the brand relationship quality in the CSR activities in the hotel industry context [94]. Lo [94], Ong et al. [98], and Mahadevan [100] measured the concept of future engagement in terms of whether the respondents would tell others about a particular product/behavior in the future, and whether they have intentions to purchase/ behave in the future. In other words, the concept of future engagement in the ISFR context can be referred to as the degree of whether potential consumers would tell/share about ISFRs with others in the future, and whether they prefer to visit ISFRs.

The current studies did not empirically prove the effect of attitudes on future engagements, but there is ample evidence of this causal relationship. Glasman and Albarracín [101] stated that attitude predicts a particular behavior in the future. They conducted a meta-analysis with correlational studies that presented participants with unknown products or issues in order to prove this relationship. Also, Rhodes and Kates [102] presented that positive responses toward a specific activity can predict the future motives and engagement in the activity, which is in line with the prospect theory [103,104]. The theories state that if people negatively evaluate a specific behavior, they will avoid participating in that behavior. However, if they evaluate a behavior positively and profitably, they are willing to engage in the behavior. The empirical studies that focused on future engagement, which is explained above, also support this relationship [94,98,100]. It can be inferred that attitudes can significantly influence future engagement. Thus, the current study postulated the fourth hypothesis as follows.

Hypothesis 4 (H4). *Attitude positively affects future engagement.*

2.5. Moderating Role of Curiosity

Curiosity is the desire to know or experience new objects, and it is caused by the gap in the knowledge about new objects [39–41]. Curiosity motivates consumers to purchase, so it is considered to be a crucial factor in the psychology of motivation [105]. The *Principles of Psychology*, which were suggested by James and Burkhardt [31], state that curiosity drives human behavior, which serves to approach a new object. In addition, according to the *Psychology of Curiosity* by Loewenstein [39], curiosity is an important motivator that affects human behavior. For example, Park et al. [46] demonstrated that curiosity evoked by advertisements had a significant impact on behavioral intentions. Hill et al. [106] discovered that curiosity plays a significant role in regard to forming the consumers' purchase motivation. In addition, curiosity relates to the pleasure of acquiring new experiences, so it can foster positive emotions and responses [44,45]. Daume and Hüttl-Maack [107] demonstrated that curiosity leads to positive emotions in regard to advertised products.

Curiosity cannot adequately explain the consumers' behavior as an independent variable, so numerous studies adopted curiosity as a moderator in the field of consumer behavior [36,38,45]. For example, curiosity strengthens the relationship between the atmospheric cues of online shopping malls and the shoppers' emotional reactions [45]. The nexus between the perceived interactivity and satisfaction can be moderated by curiosity in the e-commerce market context [36]. Curiosity also can strengthen the link between the perceived values of a fashion brand's social media and positive emotions [38]. Curious people are willing to try new experiences with uncertain outcomes, and they respond

positively to new things [42,43]. Also, curiosity also may affect the evaluation of the products [46,108]. Thus, curiosity would moderate the relationship between positive benefits and the evaluation of the products. In other words, when curious consumers perceive psychological benefits from ISFRs, they would have a more favorable attitude than the consumers with low curiosity. The fifth hypothesis is proposed, which consists of three sub-parts, based on the discussion above.

Hypothesis 5 (H5). *Curiosity strengthens the link between psychological benefits and attitude; the link between psychological benefits and attitude is shown to be higher in the group with a high level of curiosity knowledge than in the group with a low level of curiosity.*

Hypothesis 5a (H5a). *Curiosity strengthens the link between a warm glow and attitude; the link between a warm glow and attitude is shown to be higher in the group with a high level of curiosity knowledge than in the group with a low level of curiosity.*

Hypothesis 5b (H5b). *Curiosity strengthens the link between nature experiences and attitude; the link between nature experiences and attitude is shown to be higher in the group with a high level of curiosity knowledge than in the group with a low level of curiosity.*

Hypothesis 5c (H5c). *Curiosity strengthens the link between self-expressive benefits and attitude; the link between self-expressive benefits and attitude is shown to be higher in the group with a high level of curiosity knowledge than in the group with a low level of curiosity.*

3. Methodology

3.1. Measures

This paper developed the measurement items based on the previous research. First, nine items that were applied by Hartmann and Apaolaza-Ibáñez [23], Boobalan et al. [27], and Kim et al. [29] were used in order to measure the three subcategories of psychological benefits. Second, three items were adopted from Ajzen [77] and Han et al. [85] in order to measure attitude. Third, future engagement was also measured using three measurement items drawn from Stromer-Galley and Muhlberger [96], Ong et al. [98], and Lo [94]. Lastly, three-item scales from Arif et al. [36] and Park and Ha [38] were borrowed in order to measure curiosity. All 18 items were measured using a Likert scale (1: strongly disagree–7: strongly agree).

3.2. Data Collection

The data was collected from the most extensive online survey firm in South Korea, which has 1.5 million survey panel subscribers. The e-mail survey was sent to 5792 people who had dined out within the last six months. Hair et al. [109] recommended a sample size that is between 200 and 400 cases when running structural equation modeling, so the online survey targeted a sample size of approximately 300. The survey additionally collected 10% of the target sample size, so consequently 330 samples were collected, which considered the unexpected outliers. In addition, this study involves non-specific research participants, and it does not collect or record sensitive information, which is defined by Article 23 of the Korean Personal Information Protection Act, so it is not applicable to the Institutional Review Board (IRB) deliberation according to the Korean Enforcement Rules 13 of Act 16 of Bioethics [110].

The respondents answered the survey after watching a video and reading an article about ISFRs and its eco-friendly roles. The video was produced by one of the three major terrestrial broadcasting companies in Korea, which was a press release about the smart farm industry. The article introduced the eco-friendly roles of smart farms and the cases of ISFRs. The online survey page was set for the respondents to watch at least 3 min of the video and read the article for at least 3 min. Thus, the respondents answered the survey after they fully understood ISFRs. The respondents received a gift as a token of gratitude

that was worth approximately USD1 after completing the online survey. Thirteen outliers were excluded due to multivariate problems among the samples that were collected in the survey. As a result, 317 samples were used for the hypothesis tests.

4. Results

4.1. Frequency Analysis

The profile of the respondents is presented in Table 1 ($n = 317$). Among the respondents, 50.2% ($n = 159$) were males and 49.8% ($n = 158$) were females. The mean age of the respondents was 36.89 years. In regard to the respondents' monthly income, about 28.4% ($n = 90$) reported that their income was between USD2001 and USD3000. The majority of the respondents were single (53.3% and $n = 169$) and held a bachelor's degree (61.5% and $n = 195$).

Table 1. Respondent profiles ($n = 317$).

Variables	<i>n</i>	%
Gender		
Male	159	50.2
Female	158	49.8
Age (Mean = 36.89)		
20 s	93	29.3
30 s	97	30.6
40 s	95	30.0
50 s	32	10.1
Monthly income		
Under USD2000	54	17.0
USD2001–3000	90	28.4
USD3001–4000	69	21.8
USD4001–5000	42	13.2
Over USD5001	62	19.6
Marital status		
Single	169	53.3
Married	137	43.2
Widowed/Divorced	11	3.5
Education level		
Less than a high school diploma	34	10.7
Associate degree	48	15.1
Bachelor's degree	195	61.5
Graduate degree	40	12.6
Frequency of dining out		
Below to once per week	137	43.3
Once to twice per week	106	33.4
More than twice per week	74	23.3
Average check per person when dining out		
Under USD10	26	8.2
USD11 to 30	178	56.2
USD31 to 60	84	26.5
Over USD61	29	9.1
Type of companions when dining out		
Family	181	57.1
Friends	106	33.4
Alone	13	4.1
Workfellow	17	5.4

4.2. Confirmatory Factor Analysis (CFA)

The CFA was performed in order to assess the measurement model. Table 2 provides the scales and their factor loadings. In sum, Table 2 shows that all the standardized loadings were higher than 0.8 and were significant at $p < 0.001$.

Table 2. CFA: items and loadings.

Construct and Scale Items	Standardized Loading ^a
Psychological benefits	
Warm glow	
With ISFR, I can feel good because the restaurant helps to protect the environment.	0.862
With ISFR, I have the feeling of contributing to the nature environment.	0.889
With ISFR, I can feel better because the restaurant doesn't harm the environment.	0.941
Nature experiences	
ISFR can evoke the sensation of being in nature.	0.898
ISFR can make me think of nature, fields, forests, and mountains.	0.897
ISFR can make me feel close to nature.	0.884
Self-expressive benefits	
With ISFR, I can demonstrate to myself and my friends that I care about environmental conversation.	0.954
With ISFR, my friends would perceive me to be concerned about the environment.	0.943
With ISFR, I can express my environmental concern.	0.934
Attitude toward ISFR	
Unfavorable–Favorable	0.899
Bad–Good	0.827
Negative–Positive	0.819
Future engagement	
In the future, I would tell others about ISFR.	0.958
In the future, I would share about ISFR with others.	0.904
In the future, I would prefer to visit at ISFR.	0.838

^a All factors loadings are significant at $p < 0.001$.

The model fit for the measurement model is presented in Table 3. The AVE values were all over 0.5, the CR values were over 0.7, and the correlations² were lower than the AVE for each construct. Table 3 shows that the measurement model satisfied the internal consistency and convergent/discriminant validities.

Table 3. CFA: descriptive statistics and associated measures.

	Mean (SD)	AVE	(1)	(2)	(3)	(4)	(5)
(1) Warm glow	5.30 (1.10)	0.806	0.926 ^a	0.756 ^b	0.661	0.613	0.790
(2) Nature experiences	4.71 (1.29)	0.797	0.572 ^c	0.922	0.783	0.537	0.701
(3) Self-expressive benefits	4.53 (1.35)	0.891	0.437	0.613	0.961	0.376	0.660
(4) Attitude	5.80 (1.09)	0.721	0.376	0.288	0.141	0.886	0.654
(5) Future engagement	5.12 (1.22)	0.812	0.624	0.491	0.436	0.428	0.928

Notes: ^a composite reliabilities are along the diagonal, ^b correlations are above the diagonal, and ^c squared correlations are below the diagonal. Goodness-of-fit statistics: $\chi^2(73) = 188.268$, $p < 0.001$, $\chi^2/df = 2.579$, IFI = 0.976, CFI = 0.976, TLI = 0.965, and RMSEA = 0.071.

4.3. Structural Equation Modeling

This study conducted an analysis of the proposed model in two steps, which is the approach that was used by Perdue and Summers [111]. This approach examined the overidentifying restrictions of the model; the insignificant paths ($p > 0.05$) were eliminated one at a time in the sequence of the low t -values, and it finally arrived at a parsimonious final model.

First, the causal paths that were not initially hypothesized were added in the structural equation model that were based on both their theoretical plausibility and the magnitude of their modification indices. The paths of the relationships between the three sub-dimensions of psychological benefits and future engagement were added, and these causal relation-

ships can be justified with empirical studies on psychological benefits, such as Hartmann and Apaolaza-Ibáñez [23] and Policarpo and Aguiar [26]. The results revealed that (1) the link between a warm glow and future engagement and (2) the link between self-expressive benefits and future engagement were positive and significant ($p < 0.001$). Next, the insignificant paths were deleted one at a time in the sequence of the low t -values. The path of the relationship between nature experience on future engagement ($\beta = 0.049$ and $t = 0.646$ ns) was eliminated, and the study constructed a parsimonious final model.

The final model is presented in Figure 2, which is fit to the data ($\chi^2(73) = 184.143$, $p < 0.001$, $\chi^2/df = 2.523$, IFI = 0.977, CFI = 0.976, TLI = 0.966, and RMSEA = 0.069). A warm glow ($\beta = 0.496$ and $t = 5.765$ ***), nature experiences ($\beta = 0.331$ and $t = 3.110$ **), and self-expressive benefits ($\beta = 0.202$ and $t = 2.365$ *) positively affected the attitude toward ISFRs in the same order. Thus, H1 to H3 were accepted. In addition, attitude ($\beta = 0.288$ and $t = 5.705$ ***) affects future engagement, so H4 was also supported. The present study additionally discovered the link between warm glow and future engagement ($\beta = 0.433$ and $t = 6.821$ ***) and the link between self-expressive benefits and future engagement ($\beta = 0.273$ and $t = 5.707$ ***). The three predictors of attitudes consequently explained 40.5% of the attitudes ($R^2 = 0.405$), and attitude, warm glow, and self-expressive benefits explained 70.8% of future engagement ($R^2 = 0.708$). In sum, Figure 2 shows that H1 to H4 were supported and the two links (i.e., the effect of warm glow on future engagement and the effect of self-expressive benefits on future engagement) were additionally identified.

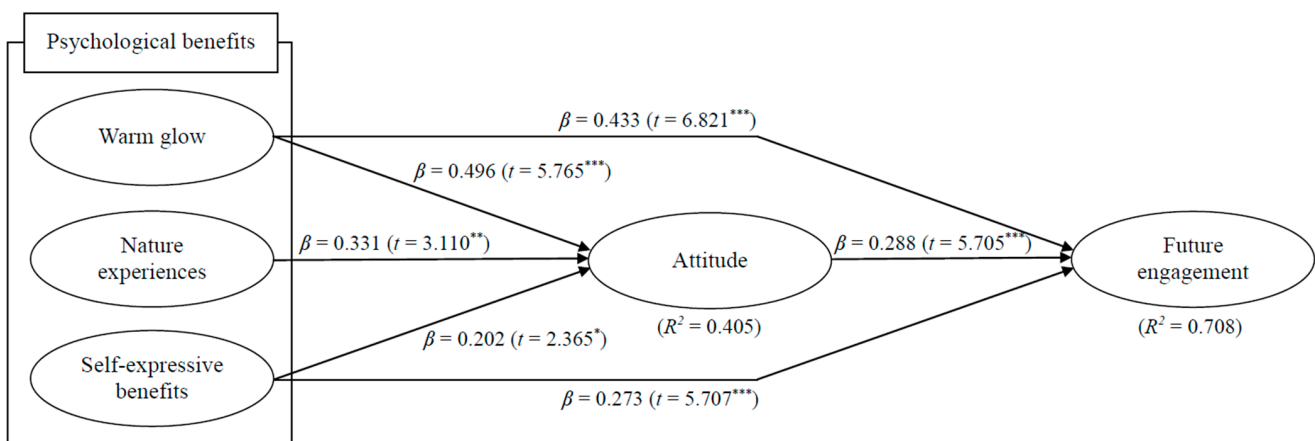


Figure 2. Final SEM model and its test results. Notes: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

4.4. Nested Model Comparisons

First, the respondents ($n = 317$) were divided into two groups, which were based on the median value of curiosity on the products, which included (1) 126 respondents who had a high level of curiosity and (2) 191 respondents who had a low level of curiosity. The nested model comparison tests were verified prior to conducting the multiple-group analysis, the results of which are presented in Table 4. The table shows that ΔCFI in each constrained step satisfied the cutoff, which is under 0.01 [112].

Table 4. Nested model comparisons.

Structural Model	χ^2	df	IFI	TLI	CFI	RMSEA	Δ CFI	$\Delta\chi^2$	Δ df
Unconstrained	257.950	146	0.974	0.963	0.974	0.049			
Measurement weights	273.464	156	0.973	0.963	0.973	0.049	0.001	15.514	10
Structural covariances	293.121	171	0.972	0.965	0.972	0.048	0.001	19.657	15
Measurement residuals	339.113	193	0.966	0.963	0.966	0.049	0.006	45.992	22
Structural Model									
Unconstrained	274.243	150	0.971	0.959	0.971	0.051			
Measurement weights	290.843	160	0.970	0.960	0.970	0.051	0.001	16.600	10
Structural weights	299.468	164	0.969	0.960	0.968	0.051	0.003	25.225	14
Structural covariances	305.580	170	0.969	0.961	0.968	0.050	0.002	14.737	10
Structural residuals	307.985	172	0.969	0.961	0.968	0.050	0.000	2.405	2
Measurement residuals	356.414	195	0.963	0.960	0.962	0.051	0.006	48.429	23

4.5. Multiple-Group Analysis

For proving whether the impact of the psychological benefits on attitudes is moderated by curiosity, this study employed a multiple-group analysis, the results of which are presented in Table 5. The findings showed that curiosity moderated the effect of a warm glow on attitude ($\Delta\chi^2 = 5.378 > 3.84$, $df = 1$, and $p < 0.05$). In regard to the group with a high level of curiosity, the β value between a warm glow and attitude was 0.765 ($t = 4.999$ ***), and the group with a low level of curiosity revealed that the β value was 0.467 ($t = 4.394$ ***). Thus, H5a was statistically supported. However, in the relationship between the other subcategories, which included nature experience and self-expressive benefits and attitude, the chi-square differences were not statistically significant ($\Delta\chi^2 = 0.053 < 3.84$, and $df = 1$). In sum, Table 5 shows that H5a was supported, and the effect of warm glow on attitude is shown to be higher in the group with a high level of curiosity knowledge than it is in the group with a low level of curiosity.

Table 5. Multiple-group analysis.

		Curiosity				Unconstrained Model	Constrained Model	$\Delta\chi^2(1) = 3.84$	Hypothesis
		High		Low					
		β	t-Value	β	t-Value				
H5a	WG→A	0.765	4.999 ***	0.467	4.394 ***		$\chi^2(151) = 285.780$	$\Delta\chi^2(1) < 5.378$	Supported
H5b	NE→A	0.038	0.326 ^{ns}	0.221	2.423 *	$\chi^2(150) = 280.402$	$\chi^2(151) = 280.455$	$\Delta\chi^2(1) > 0.053$	Not supported
H5c	SB→A	0.152	0.987 ^{ns}	0.230	2.228 *		$\chi^2(151) = 281.508$	$\Delta\chi^2(1) > 1.106$	Not supported

Notes: WG = warm glow, NE = nature experience, SB = self-expressive benefits, A = attitude, * $p < 0.05$, *** $p < 0.001$, and ^{ns} = not significant.

5. Conclusions

5.1. Discussion

The main objective of the current study was to examine the consequences of psychological benefits in the context of ISFRs. This study more specifically postulated the causal link among the three subcategories of psychological benefits (i.e., warm glow, nature experience, self-expressive benefit), attitude, and future engagement. In addition, the proposed framework was intensified by testing the moderating role of curiosity between psychological benefits and attitude. The hypotheses were tested based on 317 valid samples, which were collected in South Korea.

This study employed the SEM approach proposed by Perdue and Summers [111]. The initial result indicated that warm glow, nature experiences, and self-expressive benefits positively influenced attitude. These results are in line with previous studies [27–29]. For instance, Hwang and Kim [28] identified that warm glow, nature experience, and

self-expressive benefit positively affects attitudes in the entomophagy restaurants context. Perdue and Summers' SEM approach also captured that warm glow and self-expressive benefits significantly affected future engagement. These causal effects are also in line with empirical studies on psychological benefits, which include Hartmann and Apaolaza-Ibáñez [23] and Policarpo and Aguiar [26]. Hartmann and Apaolaza-Ibáñez [23] identified the direct effect of warm glow on purchase intention toward green energy brands, and Policarpo and Aguiar [26] also discovered that the self-expressive benefits of using an eco-friendly hybrid car positively affect purchase intentions.

The results also confirmed that there is a significant causal link between attitude and future engagement. No study examined this link, but the prospect theory [103,104], Glasman and Albarraacín [101], and Rhodes and Kates [102] supported this link. The current study consequently implies that the consumers' positive attitudes foster their future engagement. In addition, this study found the moderating role of curiosity between warm glow and attitude. In other words, the effect of warm glow on attitude is shown to be higher in the group with a high level of curiosity knowledge than it is in the group with a low level of curiosity. The concept of curiosity can play a crucial role as a moderator in regard to consumer behavior [36,38,45]. For example, Arif et al. [36] identified that the impact of perceived interactivity in the e-commerce market on consumer satisfaction is significantly moderated by curiosity. The current study implies the moderating, which is the strengthening, role of curiosity in the pro-environmental behavior. The findings of this paper consequently have both theoretical and practical significance.

5.2. Theoretical Contributions

First of all, the current study successfully examined the consequences of psychological benefits in the context of ISFRs. The existing research studied the ISFR consumers' pro-environmental behavior [30]. However, the research focused on norms, and it cannot capture the pro-environmental behavior fostered by the merits of products. Thus, this study focused on the concept of psychological benefits from a green product because of its eco-friendly role, which was suggested by Hartmann and Apaolaza-Ibáñez [23]. This study employed the SEM approach proposed by Perdue and Summers [111]. This approach has been used in the existing studies on consumer behavior [113–115]. The previous studies identified the effect of psychological benefits on attitudes [25,27,28], but the current study comprehensively captured the consequences of psychological benefits. The current study consequently has theoretical contributions by reproducing the existing theoretical framework in the ISFR context and proving the link between psychological benefits and future engagement for the first time.

In addition, this study presented empirical evidence of the causal relationship between attitude and future engagement. The present study proposed the causal relationship between attitude and future engagement that is grounded on the prospect theory [103,104], which is unlike the previous studies on attitudes toward green products that are formed by psychological benefits [27–29]. The previous studies commonly investigated the effect of attitude on behavior intentions [26,29]. However, this paper extended the previous literature by applying the concept of future engagement as a consequence of attitude for the first time.

Lastly, this paper investigated whether the effect of the psychological benefits on attitude is moderated by curiosity. This paper investigated the moderating role in the relationship between psychological benefits and attitude, which is unlike the previous research, and the results showed that curiosity strengthens the effect of a warm glow on attitude. The results of this paper consequently provided empirical evidence that curiosity significantly works as a moderator in regard to forming positive attitudes toward pro-environmental behavior for the first time.

5.3. Practical Suggestions

The findings of this paper also present the following contributions to commercializing ISFRs. First, a warm glow was the most crucial predictor of the attitude toward ISFRs and future engagement, so it is necessary for the marketers to emphasize specific ways that ISFRs contribute to environmental protection. For instance, a carbon footprint calculator is an important tool that makes the consumers support an eco-friendly product [116]. Smart farms help with environmental protection by reducing greenhouse gas emissions, so the marketers can present the amount of the reduced carbon footprint when dining out at ISFRs by advertising or posting on social media platforms. It would help the consumers become aware of how ISFRs contribute to environmental protection.

Second, self-expressive benefits also had a positive impact on attitude and future engagement. The marketers should consider specific promotions where the consumers can represent their concerns about the environment with ISFRs. The consumers tend to express their personal values on social media by uploading the postings [117]. This study proposes that the marketers should conduct a promotion by using messages in the receipts. For instance, the marketers can include messages in receipts, such as *thank you for contributing to environmental protection with our restaurant*. The marketers should also conduct a promotion that if the consumers take a photo of the receipt and upload it on their social media, the marketers will provide a particular gift or voucher via a raffle. This promotion strategy would improve the consumers' self-expressive benefits.

Third, nature experiences were a significant variable in regard to forming the attitude toward ISFRs. Visual merchandising is an important element in regard to providing a memorable experience in stores [118]. For instance, the managers can place smart farms and vegetable refrigerators in a prominent position on the tables. In addition, they should consider a biophilic interior design, such as evoking a sensation of being in nature. They also can provide wooden cutlery and bowls for the consumers, and they can use wooden trays when serving. These visual elements will aid in regard to enhancing the nature experience.

Lastly, curiosity strengthens the relationship between a warm glow and attitude. Advertising is a significant marketing tool in order to foster the consumers' curiosity [107]. Thus, the marketers should plan to advertise by focusing on evoking curiosity. For instance, they can write an advertisement copy, such as *our restaurant uses fresh ingredients from our farms. However, there is neither soil nor sunlight*. This advertising would attract the attention of the consumers and arouse their curiosity. The practical suggestions mentioned above would make the consumers have a positive attitude and improve their future engagement.

5.4. Limitations of the Study and Recommendations for Further Research

First, it is somewhat difficult to collect data from respondents who have actually visited ISFRs, because ISFRs are not fully commercialized. There is a gap between consumer intention and actual behavior [119], so future research is recommended to investigate consumer behavior with respondents who have experience with ISFRs. In addition, the current study explained ISFRs and its eco-friendly role to respondents by using film/publication, because ISFRs are not fully commercialized. There also might be the limitation of generalizability. Further research can compare groups between actual visitors and non-actual visitors who have seen/read this type of film/publication. It also can be tested in order to compare groups that have not seen/read this type of film/publication. Second, the present study collected data only in South Korea, so these findings are rather difficult to generalize, such as applying them to the consumers in other countries. Further research can examine a cross-country study by considering the cultural differences [120]. For example, cultural dimensions, such as the nature of collectivism in the east and the nature of individualism in the west can be tested as a moderator in the relationship between psychological benefits and attitudes from the perspectives of the consumers' pro-social behavior. Third, the consumers' pro-environmental behaviors are also explained by other theoretical frameworks, such as the value-belief-norm theory [121]. Thus, it is suggested that the future research extends the theoretical frameworks in the context of ISFRs. Fourth, this study measured

the antecedents and consequences at the same time using a common instrument, so it could cause a common method bias. The present study suggests collecting the data during different time periods in future research [122,123]. Lastly, the current study measured the concept of future engagement whether potential consumers would tell/share about ISFRs with others in the future, and whether they prefer to visit ISFRs. There might be differences between the study samples' responses and the actual future behavior, which is grounded on the intention-behavior gap theory [124]. Further research can address this gap by conducting panel pursuit surveys in order to measure whether individuals have actually visited the ISFRs. For example, the recommended research can test the nexus between the psychological benefits and the actual future behavior by conducting a logistic regression analysis.

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