



FROM GREEN CONSCIOUSNESS TO PURCHASE INTENTION: THE MEDIATING ROLE OF ENVIRONMENTAL ATTITUDE AND THE MODERATING EFFECT OF GREEN SELF-EFFICACY IN PAKISTAN'S FMCG SECTOR

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Abstract

This study examined how green consciousness and perceived environmental consumer effectiveness are translated into green purchase intention through environmental attitude, while assessing whether green self-efficacy strengthens the attitude-intention relationship in Pakistan's fast-moving consumer goods sector. A quantitative, cross-sectional survey design was used with 810 usable consumer responses. Five focal latent constructs were measured with twenty-five reflective indicators on a five-point Likert scale, while the structural estimates were obtained from the integrated SmartPLS model developed for the broader study. Measurement assessment showed satisfactory indicator reliability, internal consistency, convergent validity, discriminant validity, and collinearity performance. Green consciousness strongly predicted environmental attitude ($\beta = .422, p < .001$), and perceived environmental consumer effectiveness also showed a significant positive association with environmental attitude ($\beta = .333, p < .001$). Environmental attitude predicted green purchase intention ($\beta = .155, p < .001$), whereas the direct effects of green consciousness and perceived environmental consumer effectiveness on purchase intention were negligible and statistically non-significant. The indirect effects through environmental attitude were significant for green consciousness ($\beta = .066, p < .001$) and perceived environmental consumer effectiveness ($\beta = .052, p < .001$), establishing an indirect-only mediation pattern. Green self-efficacy significantly strengthened the environmental attitude-green purchase intention path ($\beta = .096, p = .001$), indicating that positive evaluations become more motivational when consumers feel capable of identifying and selecting green FMCG products. The findings position environmental attitude as the central conversion mechanism between general environmental orientation and specific buying intention, while green self-efficacy operates as a conditional facilitator rather than a simple direct predictor.

Keywords: Green Consciousness; Perceived Environmental Consumer Effectiveness; Environmental Attitude; Green Self-Efficacy; Green Purchase Intention; FMCG; PLS-SEM; Pakistan.

1. Introduction

Green consumption has moved from a specialized marketing concern to a central question in consumer research because routine purchasing decisions accumulate into substantial environmental consequences across production, packaging, distribution, use, and disposal. Zhuang et al. (2021) showed that green purchase intention is shaped by several interrelated psychological and market determinants rather than by a single environmental belief, which makes simple awareness-based explanations increasingly inadequate for consumer research. This complexity is particularly relevant in fast-moving consumer goods, where purchase



frequency is high, decision time is short, and environmentally preferable alternatives must compete with familiar products on convenience, price, availability, trust, and perceived performance.

The conceptual difficulty is not whether consumers can express concern for environmental protection, but whether that concern becomes a product-specific intention at the point where an FMCG choice is contemplated. Consumers can value sustainability while maintaining routine purchasing patterns, and the transition from general environmental orientation to a concrete intention therefore requires a psychological mechanism that evaluates the green option as desirable, credible, useful, and personally meaningful. Empirical work on environmentally responsible purchase intention has similarly emphasized that intention emerges from a structured combination of evaluation, perceived usefulness, and behavioural readiness rather than from moral approval alone (Kumar et al., 2021).

Pakistan provides an important context for testing this conversion process because environmental concern coexists with strong affordability pressures, uneven product availability, diverse retail formats, and uncertainty about green claims. Hussain and Huang (2022) found that cultural values and ecological awareness influence green purchase intention through perceived consumer effectiveness, highlighting that the belief that individual action matters can become an important part of environmentally responsible decision making. In an FMCG setting, that belief still needs to be connected with a positive evaluation of the available product, because believing that personal action can help the environment does not automatically establish that a particular detergent, food item, personal-care product, or household good is worth choosing.

The present article therefore isolates the attitudinal pathway from a broader doctoral model and examines green consciousness, perceived environmental consumer effectiveness, environmental attitude, green self-efficacy, and green purchase intention as a coherent explanatory sequence. Research on green FMCG consumption has documented a persistent distinction between intention and realized behaviour, showing that even favourable orientations toward sustainable products do not remove practical and psychological barriers to green choice (Dorsamy & Govender, 2023). This article addresses an earlier stage of that gap by asking why some environmental beliefs influence intention only after they have been converted into a favourable attitude toward green FMCG products.

The analytical objectives are to determine whether green consciousness and perceived environmental consumer effectiveness predict environmental attitude, whether environmental attitude predicts green purchase intention, whether the two upstream beliefs retain direct effects on intention after the broader model is estimated, whether environmental attitude mediates both upstream relationships, and whether green self-efficacy strengthens the environmental attitude-purchase intention path. These objectives allow the article to distinguish direct motivation from mediated conversion and conditional capability, which is more informative than treating every pro-environmental construct as an independent cause of intention. Ogiemwonyi (2024) demonstrated that determinants of green behaviour vary in strength across contexts, supporting the need for pathway-specific interpretation rather than an assumption that all favourable environmental beliefs operate in the same way.

2. Literature Review

2.1 Green Consciousness and Environmental Attitude

Green consciousness represents a broad orientation toward environmental cleanliness, conservation, responsible resource use, and sensitivity to the ecological consequences of consumption. It can influence purchase decisions by shaping what consumers notice, the product attributes they consider legitimate, and the extent to which environmental outcomes enter ordinary evaluation; in the present framework, its most immediate theoretical role is therefore the formation of environmental attitude rather than a guaranteed direct jump to purchase intention. Peiris et al. (2024) found that green FMCG behaviour can be decomposed into distinct consumption-value dimensions, reinforcing the view that environmental orientation gains behavioural relevance when it is translated into product-related evaluations.

The distinction between consciousness and attitude is important because awareness is broad whereas attitude is directed toward the focal behaviour or product class. A consumer may oppose pollution, support environmental protection, and prefer cleaner communities while remaining uncertain about whether a



particular green FMCG item is authentic, affordable, effective, or readily available, so a high level of consciousness can coexist with only moderate product evaluation. Evidence from Pakistan also indicates that green purchasing is multidimensional and affected by several consumer-level drivers, which makes attitude formation a necessary interpretive bridge between general awareness and intention (Azhar et al., 2024).

2.2 Perceived Environmental Consumer Effectiveness and Environmental Attitude

Perceived environmental consumer effectiveness captures the belief that individual consumption choices can make a meaningful contribution to environmental improvement. This belief is distinct from green consciousness because it concerns perceived consequence and agency rather than general awareness; a consumer can know that environmental degradation is serious yet doubt whether replacing one conventional FMCG product with a green alternative will produce any worthwhile environmental effect. Ogiemwonyi et al. (2023) showed that environmental factors can shape green behaviour through environmental attitude, which supports the expectation that perceived effectiveness becomes consequential when it improves the consumer's evaluation of green purchasing.

In the focal model, perceived environmental consumer effectiveness is expected to support environmental attitude because beliefs about personal impact can make green FMCG products appear more purposeful and worthwhile. When a consumer believes that repeated purchasing choices contribute to waste reduction, cleaner production, lower environmental harm, or broader community benefits, the perceived utility of choosing a green product can increase even when the immediate private benefit is modest. Pandey and Yadav (2023) demonstrated that individual concerns and perceived value shape consumption attitude and green purchase intention, providing parallel evidence that evaluative mechanisms translate broader concerns into a more specific purchase orientation.

2.3 Environmental Attitude and Green Purchase Intention

Environmental attitude in this article is a product-specific evaluative construct that reflects preference for environmentally friendly FMCG products, willingness to search for them, knowledge of what to look for, and a favourable judgment of green alternatives. This position makes attitude more proximal to intention than either green consciousness or perceived environmental consumer effectiveness because it represents the consumer's assessment of the purchasing act itself rather than an upstream environmental worldview. Nascimento and Loureiro (2024) showed that attitudes, norms, and emotions jointly contribute to the desire for green consumption, underscoring the importance of favourable evaluation in moving consumers closer to intended action.

A positive environmental attitude should increase green purchase intention because consumers who regard green FMCG products as preferable and meaningful have fewer evaluative reasons to default automatically to conventional alternatives. The expected relationship does not require attitude to explain every practical constraint; it means that, holding the wider model constant, stronger positive evaluation should correspond to stronger stated intention to consider, switch to, purchase, recommend, and seek green products. Singh et al. (2025) found strong value in combining behavioural beliefs and planned-behaviour mechanisms when explaining environmentally oriented purchase intention, which supports the treatment of attitude as a central proximal predictor.

2.4 Environmental Attitude as a Mediating Mechanism

Mediation is central to the article because the research problem concerns conversion rather than simple association. If green consciousness and perceived environmental consumer effectiveness primarily operate by shaping environmental attitude, then their indirect effects should remain significant even when their direct paths to green purchase intention are weak; such a result would mean that environmental orientation requires product-level evaluation before it becomes motivational. Shehawy (2023) documented a cross-cultural gap between pro-green orientation and enacted consumption, illustrating why researchers need to identify the mechanisms that translate favourable beliefs into more immediate readiness to choose green products.

The two mediated pathways are theoretically related but not interchangeable. Green consciousness supplies an awareness and value orientation, whereas perceived environmental consumer effectiveness supplies an agency belief about whether personal choices matter; environmental attitude integrates those



inputs into an evaluation of green FMCG products and then connects that evaluation to intention. Nekmahmud et al. (2022) demonstrated that green purchase intention is transformed by interconnected personal and communication-related factors, supporting a process perspective in which distal antecedents influence intention through more immediate psychological states.

2.5 Green Self-Efficacy as a Conditional Capability

Green self-efficacy reflects confidence in carrying out green purchasing tasks, such as distinguishing credible green products, interpreting environmental information, pursuing environmental goals through consumption, and dealing effectively with the practical demands of selecting sustainable alternatives. Its theoretical importance lies in feasibility: attitude indicates that green purchasing is desirable, while self-efficacy indicates that the consumer feels capable of performing the relevant behaviour, so the same positive attitude may produce different levels of intention at different levels of perceived capability. Tiwari (2023) found that green self-efficacy contributes meaningfully to green purchasing within a planned-behaviour framework, making it suitable as a conditional mechanism in this study.

A moderation hypothesis is more precise than assuming that green self-efficacy must always have a strong direct effect on intention. Consumers with weak environmental attitudes may possess confidence without motivation, whereas consumers with favourable attitudes may fail to translate those evaluations into intention when they are uncertain about labels, product authenticity, availability, or their own ability to choose effectively; the strongest intention should therefore emerge when desirability and capability occur together. Tawde et al. (2023) showed that self-efficacy can help explain the gap between green intention and purchase behaviour through conditional processes, which gives empirical support to a moderation-based interpretation of efficacy.

2.6 Integrated Conceptual Expectations

The integrated model proposes a sequence in which green consciousness and perceived environmental consumer effectiveness shape environmental attitude, environmental attitude predicts green purchase intention, and green self-efficacy changes the strength of the attitude-intention relationship. The design also retains direct paths from both upstream beliefs to purchase intention so that mediation can be distinguished from a simple omission of direct effects; if the indirect pathways are significant while the direct paths are not, the evidence is consistent with indirect-only mediation. Li et al. (2021) showed that green buying intention benefits from models that separate upstream environmental orientations from more proximal mechanisms and conditional identity-related influences, supporting this layered structure.

The empirical expectations are therefore directional without requiring every proposed direct path to be statistically significant. Strong GC-to-EA and PCE-to-EA paths, a significant EA-to-GPI path, significant bootstrapped indirect effects, and a positive EA-by-GSE interaction would collectively provide a coherent explanation even if GC and PCE do not retain direct effects on intention after the integrated model is estimated. Evidence from millennial green purchasing similarly shows that consumer beliefs, environmental orientation, and planned-behaviour components work as a system rather than as isolated determinants (Mabkhot, 2024).

3. Materials and Method

3.1 Research Design

The study used a quantitative, positivist, deductive, and cross-sectional design. The data originated from a structured consumer questionnaire developed for a doctoral investigation of green purchase intention in Pakistan's FMCG sector, and the unit of analysis was the individual FMCG consumer. Purposive sampling was used because respondents needed sufficient familiarity with routine FMCG purchasing to evaluate statements concerning environmentally friendly products, personal environmental responsibility, green product knowledge, consumer capability, and future purchasing intention.

3.2 Sample and Data Collection

The final analytical dataset contained 810 usable responses and 47 columns. The file consisted of one respondent identifier, six demographic and shopping-profile variables, and forty Likert-scale indicators representing eight latent constructs in the broader model; the present article focuses on Green Consciousness,



Perceived Environmental Consumer Effectiveness, Environmental Attitude, Green Self-Efficacy, and Green Purchase Intention. Data screening confirmed that every respondent had complete information for the retained variables, no indicator column was absent, the response direction was consistent across the measurement blocks, and no missing-value imputation was required.

3.3 Measurement Instrument

The questionnaire measured each latent construct with five reflective indicators on a five-point agreement scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Green Consciousness measured respect for environmental cleanliness, sensitivity to contamination, support for preservation efforts, appreciation of healthy surroundings, and respect for environmental rules. Perceived Environmental Consumer Effectiveness measured the belief that individual FMCG choices can contribute to environmental protection, Environmental Attitude captured preference and product-oriented evaluation of green FMCG alternatives, Green Self-Efficacy represented confidence in carrying out green purchasing tasks, and Green Purchase Intention measured willingness to consider, switch to, purchase, recommend, and make an effort to obtain green FMCG products.

3.4 Data Analysis

Partial Least Squares Structural Equation Modelling was conducted in SmartPLS using the existing integrated structural model. The measurement model was evaluated before interpreting the structural relationships, with indicator reliability assessed through outer loadings, internal consistency assessed through Cronbach's alpha, rho_A, and composite reliability, convergent validity assessed through average variance extracted, and discriminant validity assessed through the Fornell-Larcker criterion and heterotrait-monotrait ratios. Indicator and structural collinearity were assessed through variance inflation factors, and the original five-item reflective blocks were retained because all loadings met the applied item-retention criterion.

Structural assessment focused on the paths from Green Consciousness and Perceived Environmental Consumer Effectiveness to Environmental Attitude, their direct paths to Green Purchase Intention, the Environmental Attitude to Green Purchase Intention path, the Green Self-Efficacy main effect, and the Environmental Attitude by Green Self-Efficacy interaction. The full model also retained the social and normative constructs from the doctoral framework so that the focal coefficients were estimated within the integrated theoretical specification rather than from an isolated bivariate system. R-square and adjusted R-square were used to describe explained variance, f-square values were used to assess the contribution of individual predictors, and Q-square values were used to evaluate predictive relevance.

Bootstrapping supplied standard errors, t-values, p-values, and confidence intervals for direct, indirect, and interaction effects. Statistical significance was evaluated at the .05 level using two-tailed decisions, and a structural relationship was treated as supported only when its direction and inferential evidence were consistent with the proposed effect. Mediation was evaluated from the bootstrapped indirect effects $GC \rightarrow EA \rightarrow GPI$ and $PCE \rightarrow EA \rightarrow GPI$, while moderation was evaluated from the coefficient of the product term $EA \times GSE \rightarrow GPI$.

All reported numerical values in the Results section were retained from the collected dataset and the existing PLS-SEM output. Non-significant direct effects were not altered or recoded to obtain a preferred outcome; instead, the article treats them as substantive evidence about the location of the explanatory mechanism. This approach is especially relevant to the stated research problem because a non-significant direct path can coexist with a significant indirect effect, allowing the analysis to identify environmental attitude as the mechanism through which environmental orientation becomes connected with green purchase intention.

4. Results

4.1 Data Integrity and Analytical Scope

The analytical file was complete and internally consistent for all 810 respondents. Each row represented one consumer and contained a respondent identifier, six demographic or shopping-profile variables, and forty measurement indicators, giving 47 variables in total. All indicator values were present, the scale direction was consistent, and every focal construct retained its full five-item block. The absence of



missing observations meant that the descriptive summaries, construct scores, outer loadings, reliability coefficients, correlations, and structural effects were based on the same respondent pool rather than on changing effective sample sizes across tests.

The article concentrated on twenty-five indicators belonging to GC, PCE, EA, GSE, and GPI, while the structural coefficients were interpreted within the broader integrated PLS-SEM model from which they were obtained. This distinction matters because the direct effects on GPI reflect competition among the predictors present in the complete structural equation, not isolated zero-order associations. The approach therefore permits a stronger test of the article's core proposition: if GC and PCE predict EA strongly but lose direct predictive power for GPI once proximal and competing constructs are included, the evidence favours a conversion mechanism rather than a direct-awareness explanation.

The data structure also supported a clean comparison between upstream beliefs, the mediating attitude, conditional capability, and the outcome. GC and PCE were treated as antecedent constructs, EA as the mediator, GSE as the moderator and potential main-effect predictor, and GPI as the principal outcome. Because all focal constructs were measured by equal numbers of items and on the same response scale, differences in construct means and reliability cannot be attributed to unequal item counts or incompatible scoring metrics; they represent genuine differences in response tendency and measurement behaviour within the collected sample.

4.2 Respondent Profile

The respondent profile showed broad participation across the two coded collection locations and a nearly balanced gender composition. City 1 contributed 419 cases, equivalent to 51.73% of the sample, while City 2 contributed 391 cases or 48.27%. Male respondents accounted for 406 cases and female respondents for 404, producing a distribution close to 50% in each group. The spatial and gender balance reduces the likelihood that the observed focal relationships are simply descriptive reflections of one dominant coded site or one dominant gender group within the available purposive sample.

Table 1

Respondent Profile of the Analytical Sample

Profile Variable	Category	n	%
City	City 1	419	51.73
City	City 2	391	48.27
Gender	Male	406	50.12
Gender	Female	404	49.88
Age	20-25	179	22.10
Age	25-35	285	35.19
Age	35-45	200	24.69
Age	45-55	97	11.97
Age	55 and above	49	6.05
Education	Matric	62	7.65
Education	Intermediate	169	20.86
Education	Graduate	350	43.21
Education	MS/M.Phil	171	21.11
Education	PhD	24	2.96
Education	Others	34	4.20
Occupation	House maker	89	10.99
Occupation	Business	143	17.65
Occupation	Job	309	38.15
Occupation	Student	209	25.80
Occupation	Others	60	7.41
Preferred store	Hyper Star	145	17.90



Profile Variable	Category	n	%
Preferred store	Metro Cash and Carry	137	16.91
Preferred store	CSD	55	6.79
Preferred store	Al-Fatah	155	19.14
Preferred store	Utility Store	92	11.36
Preferred store	Nearby store	226	27.90

Age was concentrated in the economically and socially active adult categories. Respondents aged 25-35 formed the largest category with 285 cases or 35.19%, followed by 35-45 years with 200 cases or 24.69% and 20-25 years with 179 cases or 22.10%. The two older categories were smaller, with 97 respondents aged 45-55 and 49 respondents aged 55 years or above. The resulting profile provides substantial representation of consumers likely to participate frequently in household and personal FMCG purchasing, while still retaining observations across the complete age range specified by the questionnaire.

Education was weighted toward respondents with tertiary qualifications. Graduates constituted 350 respondents or 43.21%, MS/M.Phil respondents accounted for 171 or 21.11%, Intermediate education accounted for 169 or 20.86%, Matric respondents numbered 62, PhD respondents numbered 24, and 34 respondents reported other educational categories. This composition is useful for interpreting the focal environmental constructs because a large proportion of participants had substantial formal education, yet the construct means still showed a visible difference between broad green consciousness and more specific environmental attitude, indicating that educational exposure did not eliminate the conversion issue explored in the article.

Occupationally, job holders were the largest group at 309 respondents or 38.15%, followed by students at 209 or 25.80%, business respondents at 143 or 17.65%, house makers at 89 or 10.99%, and other occupations at 60 or 7.41%. Store preference also revealed a practical feature of the FMCG setting: nearby stores were the single largest category at 226 respondents or 27.90%, followed by Al-Fatah at 19.14%, Hyper Star at 17.90%, Metro Cash and Carry at 16.91%, Utility Store at 11.36%, and CSD at 6.79%. This distribution emphasizes that green purchase intention in the sample was embedded in routine retail contexts rather than only in large-format or premium shopping environments.

4.3 Construct and Item Descriptive Results

The focal construct means were all above the neutral midpoint of 3.00, indicating that the average respondent expressed a generally favourable orientation across environmental awareness, perceived effectiveness, attitude, self-efficacy, and purchase intention. GC recorded the highest focal mean at 3.812 with a standard deviation of 0.639, followed by GPI at 3.683, PCE at 3.638, GSE at 3.577, and EA at 3.525. The ordering is theoretically informative because the broadest environmental orientation was strongest, while the product-specific evaluative construct was lowest, providing descriptive evidence of a gap between general environmental consciousness and the more immediate evaluation of green FMCG products.

Table 2

Descriptive Statistics for Focal Latent Constructs

Code	Construct	Mean	SD	Min	Max
GC	Green Consciousness	3.812	0.639	1.8	5.0
PCE	Perceived Environmental Consumer Effectiveness	3.638	0.646	1.8	5.0
EA	Environmental Attitude	3.525	0.664	1.6	5.0
GSE	Green Self-Efficacy	3.577	0.670	1.2	5.0
GPI	Green Purchase Intention	3.683	0.646	1.8	5.0

The dispersion of the construct scores was moderate and similar across the five focal variables, with standard deviations ranging from 0.639 for GC to 0.670 for GSE. This similarity indicates that differences in structural relationships are not explained by one construct having almost no variability while another has a much broader distribution. Minimum scores also confirm meaningful heterogeneity: EA reached a minimum



of 1.6 and GSE 1.2, while all constructs reached the maximum of 5.0, demonstrating that the sample included consumers with weak, moderate, and strong orientations rather than clustering tightly at the favourable end of the scale.

Item-level means provided a more granular view of the construct profiles. Within GC, GC5 produced the highest mean at 3.857 and GC4 the lowest at 3.763, a narrow spread of 0.094 points that indicates consistent endorsement of the environmental consciousness domain. PCE items ranged from 3.601 to 3.688, with PCE4 highest, while EA ranged from 3.462 to 3.600, with EA3 highest and EA4 lowest. These ranges show that the lower EA construct mean was not created by a single aberrant item; all five attitude items were positioned below the overall GC mean, supporting the interpretation of a general-to-specific evaluation gap.

Table 3

Item-Level Means and Standard Deviations for Focal Constructs

Indicator	Mean	SD
GC1	3.788	0.830
GC2	3.843	0.828
GC3	3.811	0.838
GC4	3.763	0.841
GC5	3.857	0.821
PCE1	3.601	0.838
PCE2	3.641	0.844
PCE3	3.646	0.845
PCE4	3.688	0.823
PCE5	3.614	0.844
EA1	3.463	0.864
EA2	3.522	0.871
EA3	3.600	0.832
EA4	3.462	0.871
EA5	3.578	0.854
GSE1	3.541	0.865
GSE2	3.622	0.850
GSE3	3.651	0.864
GSE4	3.652	0.842
GSE5	3.419	0.859
GPI1	3.667	0.850
GPI2	3.733	0.843
GPI3	3.598	0.840
GPI4	3.696	0.813
GPI5	3.722	0.864

The GSE item means displayed a slightly wider internal pattern. GSE4 and GSE3 were the highest at 3.652 and 3.651, whereas GSE5 was lower at 3.419, suggesting that respondents were more confident in some routine green purchasing tasks than in the broader ability to generate creative environmental solutions through purchasing. GPI items were comparatively stable, ranging from 3.598 for GPI3 to 3.733 for GPI2. The highest intention item therefore concerned switching to environmentally friendly products for health-related reasons, while the lower item still remained clearly above the scale midpoint, showing that all dimensions of intended green purchasing were positively oriented on average.

The descriptive hierarchy is compatible with the article's structural premise. Consumers were most positive about broad environmental consciousness, less positive about their individual effectiveness, and less positive again about product-specific environmental attitude, while purchase intention remained moderately favourable. This pattern leaves room for a mediating mechanism because the population can exhibit strong



broad values without those values being identical to product evaluation. It also leaves room for moderation because GSE was favourable but not extremely high, meaning that the sample contained sufficient capability variation for an interaction with environmental attitude to be estimated.

4.4 Indicator Reliability

All twenty-five focal indicators were retained in the reflective measurement model. GC loadings ranged from 0.759 to 0.781, PCE from 0.758 to 0.782, EA from 0.760 to 0.784, GSE from 0.770 to 0.792, and GPI from 0.756 to 0.774. The lowest focal loading, 0.756 for GPI4, remained above the applied approximate 0.70 retention criterion, while the highest loading, 0.792 for GSE3, indicated strong representation of green self-efficacy. The narrow loading ranges within each construct show that no latent variable depended disproportionately on one item while the remaining indicators contributed weakly.

Table 4

Outer Loadings and Item-Retention Decisions

Construct	Indicator	Outer Loading	Loading ²	Decision
GC	GC1	0.766	0.587	Retain
GC	GC2	0.781	0.610	Retain
GC	GC3	0.759	0.576	Retain
GC	GC4	0.772	0.596	Retain
GC	GC5	0.762	0.581	Retain
PCE	PCE1	0.772	0.596	Retain
PCE	PCE2	0.758	0.575	Retain
PCE	PCE3	0.771	0.594	Retain
PCE	PCE4	0.766	0.587	Retain
PCE	PCE5	0.782	0.612	Retain
EA	EA1	0.769	0.591	Retain
EA	EA2	0.760	0.578	Retain
EA	EA3	0.778	0.605	Retain
EA	EA4	0.775	0.601	Retain
EA	EA5	0.784	0.615	Retain
GSE	GSE1	0.783	0.613	Retain
GSE	GSE2	0.790	0.624	Retain
GSE	GSE3	0.792	0.627	Retain
GSE	GSE4	0.770	0.593	Retain
GSE	GSE5	0.781	0.610	Retain
GPI	GPI1	0.763	0.582	Retain
GPI	GPI2	0.770	0.593	Retain
GPI	GPI3	0.774	0.599	Retain
GPI	GPI4	0.756	0.572	Retain
GPI	GPI5	0.771	0.594	Retain

The squared loadings also indicated that individual items explained meaningful portions of their latent construct variance. Across the focal blocks, squared loadings were generally between about 0.57 and 0.63, meaning that each retained indicator shared more than half of its variance with the construct it was intended to measure. This is important for mediation and moderation because unstable or weak measurement at the indicator level can obscure indirect and interaction effects. The retained measurement structure therefore provided a sound basis for comparing the strengths of the GC-to-EA, PCE-to-EA, EA-to-GPI, and EA-by-GSE paths.

The pattern across constructs was balanced rather than artificially uniform. GSE had several of the highest loadings, which is consistent with its strong internal consistency statistics, yet EA, GC, PCE, and GPI also maintained compact and acceptable loading ranges. No indicator removal was required to obtain a



favorable structural pattern, so the final coefficients were derived from the same five-item constructs specified in the questionnaire. This preserves substantive coverage of each concept and reduces the risk that results were driven by post hoc deletion of difficult items.

4.5 Internal Consistency and Convergent Validity

Internal consistency was satisfactory for every focal construct across Cronbach's alpha, rho_A, and composite reliability. Alpha values ranged from 0.825 for GPI to 0.842 for GSE, rho_A values ranged from 0.877 to 0.888, and composite reliability values ranged from 0.877 to 0.888. These coefficients are sufficiently close to one another to indicate stable internal consistency without suggesting that the items were exact duplicates. The strongest reliability profile belonged to GSE, while the remaining constructs showed very similar values, supporting comparison among them within one structural model.

Table 5

Internal Consistency and Convergent Validity

Construct	Alpha	rho_A	CR	AVE
GC	0.826	0.878	0.878	0.590
PCE	0.828	0.879	0.879	0.593
EA	0.832	0.881	0.881	0.598
GSE	0.842	0.888	0.888	0.613
GPI	0.825	0.877	0.877	0.588

Convergent validity was established because all focal AVE values exceeded 0.50. GC recorded an AVE of 0.590, PCE 0.593, EA 0.598, GSE 0.613, and GPI 0.588. GSE therefore captured the largest average share of indicator variance, while GPI recorded the smallest focal AVE, yet even the lowest value indicated that the construct explained more than half of the variance in its five indicators. The convergence evidence is especially relevant for EA because the mediation result requires EA to function as a coherent latent mechanism rather than as a loose collection of unrelated product-evaluation statements.

The relationship between reliability and AVE further supports the measurement model. Composite reliability was high enough to demonstrate consistency, while AVE remained in a range that confirms substantive common variance rather than relying only on the number of indicators. This balance matters because extremely high reliability combined with weak discriminant validity could indicate redundant constructs, whereas the present model also satisfied the discriminant tests reported in the next subsection. The focal blocks can therefore be interpreted as reliable and convergent representations of conceptually distinct stages in the green purchasing process.

4.6 Discriminant Validity and Collinearity

The Fornell-Larcker results supported discriminant validity among the five focal constructs. The diagonal square-root-of-AVE values were 0.768 for GC, 0.770 for PCE, 0.773 for EA, 0.783 for GSE, and 0.767 for GPI, and each exceeded the corresponding correlations with the other focal constructs. The largest focal correlation was between GC and EA at 0.533, followed by PCE and EA at 0.473, which is theoretically expected because both upstream beliefs were specified as predictors of attitude. These correlations were clearly below their relevant diagonal values, indicating that predictive association did not collapse the constructs into the same empirical variable.

Table 6

Fornell-Larcker Matrix for Focal Constructs

	GC	PCE	EA	GSE	GPI
GC	0.768	0.333	0.533	0.263	0.294
PCE	0.333	0.770	0.473	0.318	0.289
EA	0.533	0.473	0.773	0.261	0.377
GSE	0.263	0.318	0.261	0.783	0.286
GPI	0.294	0.289	0.377	0.286	0.767



The focal HTMT matrix produced the same conclusion. The highest HTMT value was 0.643 between GC and EA, followed by 0.570 between PCE and EA and 0.455 between EA and GPI. All values remained comfortably below the conservative boundary applied in the analysis, so the constructs retained empirical distinctiveness despite their theoretical connections. This result is central to the article because the mediation claim depends on GC and PCE being distinguishable from EA; if the upstream constructs and mediator were statistically indistinguishable, the indirect paths would have little conceptual meaning.

Table 7

HTMT Ratios for Focal Constructs

	GC	PCE	EA	GSE	GPI
GC	1.000	0.402	0.643	0.315	0.355
PCE	0.402	1.000	0.570	0.381	0.349
EA	0.643	0.570	1.000	0.311	0.455
GSE	0.315	0.381	0.311	1.000	0.344
GPI	0.355	0.349	0.455	0.344	1.000

Outer VIF values showed no problematic indicator collinearity. The focal ranges were 1.592-1.701 for GC, 1.579-1.701 for PCE, 1.587-1.733 for EA, 1.665-1.766 for GSE, and 1.596-1.662 for GPI. These values indicate that the five indicators within each reflective block were related without being so redundant that coefficient stability would be threatened. The highest focal outer VIF of 1.766 occurred within GSE and remained far below common levels associated with problematic multicollinearity.

Table 8

Collinearity Diagnostics for Focal Indicators and Structural Predictors

Construct/Effect	Diagnostic Level	VIF	Decision
GC	Outer indicators	1.592-1.701	Acceptable
PCE	Outer indicators	1.579-1.701	Acceptable
EA	Outer indicators	1.587-1.733	Acceptable
GSE	Outer indicators	1.665-1.766	Acceptable
GPI	Outer indicators	1.596-1.662	Acceptable
GC→EA	Inner structural	1.124	Acceptable
PCE→EA	Inner structural	1.124	Acceptable
GC→GPI	Inner structural	1.484	Acceptable
PCE→GPI	Inner structural	1.403	Acceptable
EA→GPI	Inner structural	1.674	Acceptable
GSE→GPI	Inner structural	1.244	Acceptable
EA×GSE→GPI	Inner structural	1.174	Acceptable

Inner VIF values were also low. GC and PCE each had an inner VIF of 1.124 when predicting EA, while the focal GPI predictors showed VIF values of 1.484 for GC, 1.403 for PCE, 1.674 for EA, 1.244 for GSE, and 1.174 for the EA-by-GSE interaction. The low interaction VIF is useful because product terms can sometimes create collinearity that makes moderation coefficients unstable. Here, the interaction effect was estimated in an environment where predictor redundancy was limited, strengthening confidence that its positive coefficient reflects a meaningful conditional relationship rather than a numerical artifact of severe collinearity.

4.7 Explanatory Power, Predictive Relevance, and Effect Sizes

Environmental attitude had an R-square of 0.383 and an adjusted R-square of 0.381. The small difference between the two values indicates that the explained variance was not inflated materially by model complexity, and the two upstream focal predictors provided a substantial account of variation in product-specific attitude. The corresponding Q-square value for EA was 0.375, which was positive and therefore supported predictive relevance. Together, these statistics indicate that GC and PCE were not merely



statistically significant predictors; they formed an explanatory structure with meaningful predictive information for the mediator.

Table 9

Explanatory Power, Predictive Relevance, and Focal Effect Sizes

Outcome/Effect	Statistic	Value
EA	R ²	.383
EA	Adjusted R ²	.381
EA	Q ²	.375
GPI	R ² (full model)	.423
GPI	Adjusted R ² (full model)	.417
GPI	Q ² (full model)	.412
GC→EA	f ²	0.257
PCE→EA	f ²	0.159
GC→GPI	f ²	0.000
PCE→GPI	f ²	0.000
EA→GPI	f ²	0.025
GSE→GPI	f ²	0.004
EA×GSE→GPI	f ²	0.014

Green purchase intention had an R-square of 0.423 and an adjusted R-square of 0.417 in the full integrated model. Because the complete doctoral specification retained social and normative predictors alongside the focal attitudinal pathway, this value should be interpreted as the explanatory performance of the integrated model rather than as variance attributable only to GC, PCE, EA, and GSE. The Q-square value for GPI was 0.412, confirming positive predictive relevance for the principal outcome. The focal article therefore evaluates the contribution and mechanism of the attitudinal path within a model that explains a meaningful share of purchase-intention variation.

Effect-size analysis clarified the relative importance of individual focal predictors. GC produced an f-square of 0.257 for EA and PCE an f-square of 0.159, both classified as medium contributions, which aligns with their large and highly significant structural coefficients. The effect of EA on GPI was smaller at f-square = 0.025, while the direct f-square values of GC and PCE on GPI were essentially zero. This contrast is especially informative because it shows that the upstream constructs matter strongly for the mediator while contributing negligible unique variance directly to intention after the complete model is considered.

The main effect of GSE on GPI had an f-square of 0.004, and the EA-by-GSE interaction had an f-square of 0.014. The conventional f-square classification therefore describes the interaction's incremental variance contribution as small, even though its bootstrapped coefficient was statistically significant. Statistical significance and effect size answer different questions: the significant interaction establishes that the EA-to-GPI slope changes systematically with GSE, while the small f-square indicates that the incremental explained variance produced by that product term is modest relative to the full set of predictors. This combination is plausible in a large consumer sample and supports a measured, pathway-specific interpretation of green self-efficacy.

4.8 Direct Structural Effects

The direct structural results strongly supported both antecedent-to-attitude relationships. GC predicted EA with a standardized coefficient of 0.422, a standard error of 0.028, $t = 15.282$, and $p < .001$; the 95% confidence interval extended from 0.367 to 0.474 and remained entirely positive. PCE predicted EA with $\beta = 0.333$, standard error = 0.028, $t = 12.061$, and $p < .001$, with a confidence interval from 0.279 to 0.386. The similarity in standard errors and the clearly separated positive intervals demonstrate stable evidence that both environmental consciousness and perceived personal effectiveness contribute to a more favourable environmental attitude toward green FMCG products.



Table 10

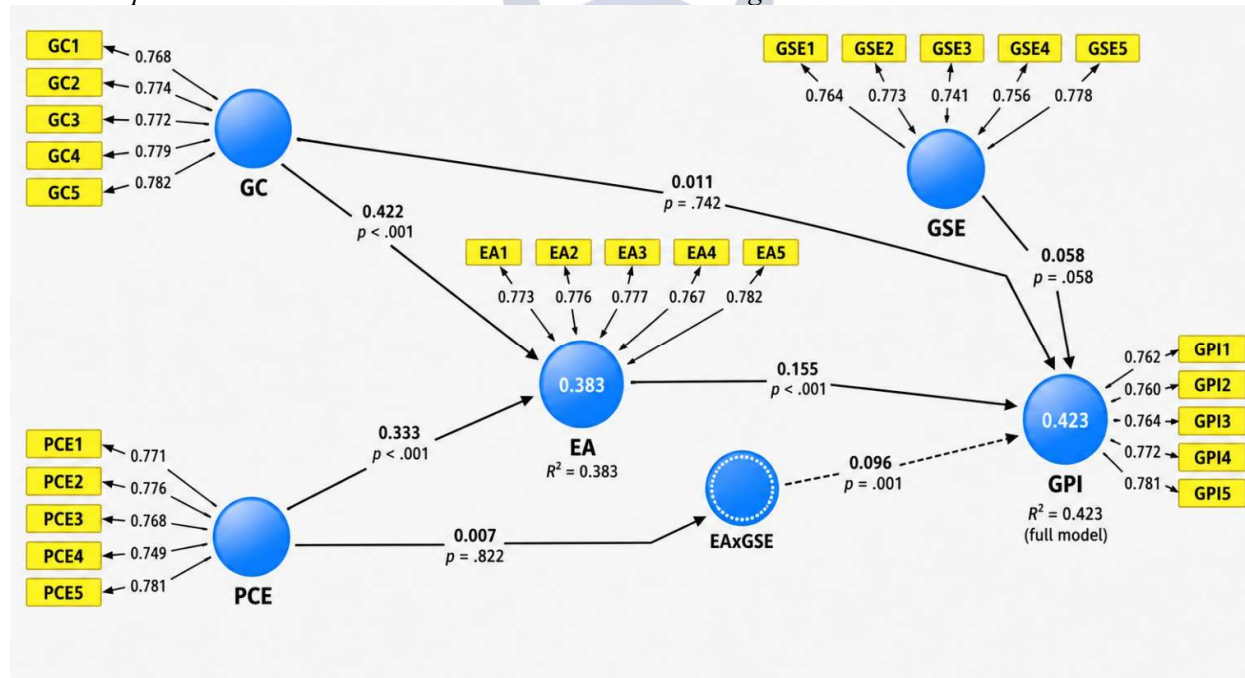
Bootstrapped Direct Effects in the Focal Attitudinal Pathway

Effect	β	SE	t	p	95% CI	Decision
GC $\rightarrow$ EA	0.422	0.028	15.282	< .001	[0.367, 0.474]	Supported
PCE $\rightarrow$ EA	0.333	0.028	12.061	< .001	[0.279, 0.386]	Supported
GC $\rightarrow$ GPI	0.011	0.032	0.330	0.742	[-0.053, 0.073]	Not supported
PCE $\rightarrow$ GPI	0.007	0.032	0.225	0.822	[-0.055, 0.069]	Not supported
EA $\rightarrow$ GPI	0.155	0.035	4.406	< .001	[0.086, 0.223]	Supported
GSE $\rightarrow$ GPI	0.054	0.028	1.897	0.058	[-0.001, 0.110]	Not supported
EA $\times$ GSE $\rightarrow$ GPI	0.096	0.029	3.346	0.001	[0.041, 0.152]	Supported

The relative magnitude of the two coefficients indicates that GC was the stronger predictor of EA in this sample. Its coefficient exceeded the PCE coefficient by 0.089, and its f-square was also larger, 0.257 versus 0.159. This does not reduce the importance of PCE; it means that broad environmental consciousness contributed somewhat more unique explanatory information to product-specific attitude than the belief that an individual's own purchasing choices can improve environmental outcomes. Both relationships were strong enough to support the first two analytical objectives without relying on marginal significance decisions.

Figure 1

Focal direct paths and the EA $\times$ GSE interaction within the integrated PLS-SEM model.



EA in turn predicted GPI positively and significantly. The standardized coefficient was 0.155 with a standard error of 0.035, $t = 4.406$, $p < .001$, and a confidence interval from 0.086 to 0.223. The coefficient is smaller than the upstream paths into EA, which indicates attenuation as the model moves from general environmental orientation through product evaluation to purchase intention in the presence of other predictors. The effect nevertheless remained clearly different from zero, establishing that respondents with more favourable environmental attitudes tended to report stronger green purchase intentions after the wider structural model was taken into account.

In contrast to the strong paths through EA, the direct GC-to-GPI coefficient was only 0.011. Its t-value was 0.330, $p = .742$, and the confidence interval ranged from -0.053 to 0.073, crossing zero by a wide margin. The PCE-to-GPI coefficient was similarly negligible at 0.007, with $t = 0.225$, $p = .822$, and a confidence



interval from -0.055 to 0.069. These results show that neither upstream construct retained a meaningful direct relationship with GPI once EA and the other predictors in the integrated model were considered.

The null direct effects are central evidence rather than failed evidence for the article's theoretical argument. If GC and PCE had remained strong direct predictors alongside strong indirect effects, the role of EA would have been one pathway among several. Instead, the data show a much sharper pattern: both antecedents strongly predict EA, EA predicts GPI, and the antecedent direct paths to GPI are near zero. The structural profile therefore localizes the explanatory mechanism within environmental attitude and provides a coherent answer to why broad environmental awareness does not automatically become a purchase intention.

GSE also did not show a statistically significant main effect on GPI at the .05 level. Its coefficient was 0.054, $t = 1.897$, $p = .058$, with a confidence interval extending from -0.001 to 0.110. The value sits close to the conventional threshold but the confidence interval includes zero, so the direct effect was treated as unsupported. This finding is useful because it differentiates being generally confident about green purchasing tasks from the conditional role of confidence in strengthening an existing positive attitude, which is evaluated through the interaction term rather than through the main effect alone.

4.9 Mediation Results

The bootstrapped indirect effect from GC to GPI through EA was positive and statistically significant. The original indirect coefficient was 0.066, the bootstrap mean was 0.065, the standard error was 0.016, $t = 4.219$, and $p < .001$. The 95% confidence interval ranged from 0.036 to 0.097 and did not include zero. Because the corresponding direct GC-to-GPI path was 0.011 and non-significant, the result is consistent with an indirect-only mediation pattern in which green consciousness contributes to purchase intention primarily by improving environmental attitude.

Table 11

Bootstrapped Indirect Effects Through Environmental Attitude

Indirect Effect	β	SE	t	p	95% CI	Decision
GC $\rightarrow$ EA $\rightarrow$ GPI	0.066	0.016	4.219	< .001	[0.036, 0.097]	Supported
PCE $\rightarrow$ EA $\rightarrow$ GPI	0.052	0.013	4.013	< .001	[0.028, 0.078]	Supported

The PCE pathway produced the same structural logic. Its indirect effect through EA was 0.052, with a bootstrap mean of 0.052, standard error of 0.013, $t = 4.013$, and $p < .001$; the confidence interval ranged from 0.028 to 0.078. The direct PCE-to-GPI effect was only 0.007 and non-significant. This pairing indicates that believing individual consumer choices can help the environment becomes relevant to purchase intention when that belief is translated into a favourable evaluation of environmentally friendly FMCG products rather than functioning as an immediate independent buying motive.

Comparing the two indirect effects shows that the mediated contribution of GC was somewhat larger than that of PCE. The difference of 0.014 parallels the stronger GC-to-EA coefficient and suggests that broad consciousness supplies a slightly stronger upstream input into the attitude mechanism. The total standardized effects obtained by adding the direct and indirect components were approximately 0.077 for GC and 0.059 for PCE; about 85.7% of the GC total and 88.1% of the PCE total were represented by the estimated indirect components. These proportions are descriptive decompositions of the reported coefficients and reinforce the dominance of mediation in both pathways.

The mediation findings address the core research problem directly. Consumers can be environmentally conscious or believe that individual action matters without expressing a correspondingly strong direct intention to purchase green FMCG products, because broad beliefs remain distal to the product decision. EA provides the evaluative conversion stage: the consumer must translate environmental orientation into preference, search readiness, knowledge, and positive judgment concerning green products before intention rises. The significant indirect effects show that the upstream constructs are not irrelevant to purchase intention; their relevance is routed through a more proximal psychological state.

This indirect-only pattern also guards against an overly expansive interpretation of environmental values. It would be inaccurate to claim that every environmentally positive belief independently drives



purchasing intention, because the direct estimates do not support that statement. The results instead provide a more disciplined model in which different constructs occupy different positions in the decision process. GC and PCE form attitude, EA provides direct motivational relevance, and the conditional role of GSE determines how strongly that attitude is translated into GPI.

4.10 Moderation by Green Self-Efficacy

The EA-by-GSE interaction significantly predicted GPI. The standardized interaction coefficient was 0.096, with a standard error of 0.029, $t = 3.346$, $p = .001$, and a 95% confidence interval from 0.041 to 0.152. The positive sign means that the relationship between environmental attitude and green purchase intention becomes stronger as green self-efficacy increases. This result supports the moderation objective and demonstrates that capability is not merely an additive background characteristic; it changes the motivational value of environmental attitude.

Table 12

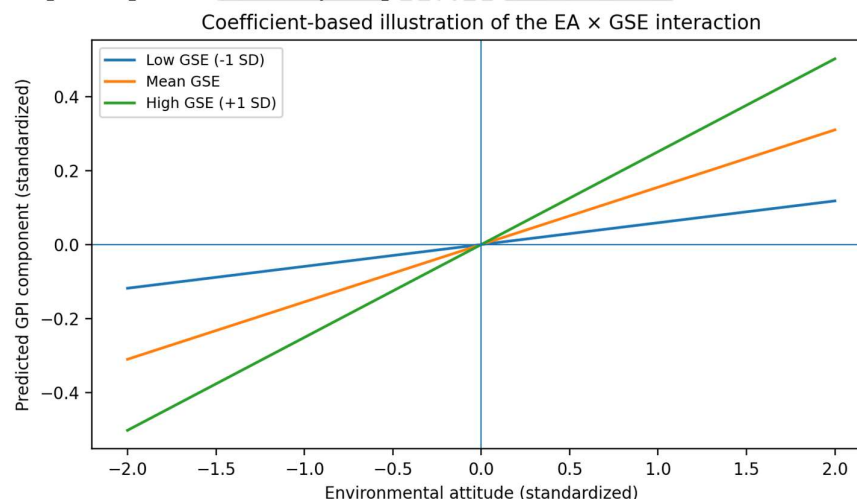
Moderation of the Environmental Attitude-Green Purchase Intention Relationship

Effect/Conditional Slope	β	SE	t	p	95% CI	Decision
EA $\rightarrow$ GPI	0.155	0.035	4.406	< .001	[0.086, 0.223]	Supported
GSE $\rightarrow$ GPI	0.054	0.028	1.897	0.058	[-0.001, 0.110]	Not supported
EA $\times$ GSE $\rightarrow$ GPI	0.096	0.029	3.346	0.001	[0.041, 0.152]	Supported
Illustrative EA slope at low GSE (-1 SD)	0.059	—	—	—	—	Derived
Illustrative EA slope at mean GSE	0.155	—	—	—	—	Derived
Illustrative EA slope at high GSE (+1 SD)	0.251	—	—	—	—	Derived

The interaction can be expressed through a standardized conditional-slope illustration. Using the estimated EA main effect of 0.155 and the interaction coefficient of 0.096, the implied EA slope at one standard deviation below the GSE mean is approximately 0.059, the slope at the mean level of GSE is 0.155, and the slope at one standard deviation above the mean is approximately 0.251. These values are coefficient-based illustrations rather than separately bootstrapped simple-slope tests, yet they communicate the direction and practical meaning of the positive interaction: favourable environmental attitude is much more strongly connected to intention among consumers who also feel capable of carrying out green purchasing tasks.

Figure 2

Coefficient-based simple-slope illustration of the positive EA $\times$ GSE interaction



The moderation result is especially informative when viewed beside the non-significant GSE main effect. GSE alone had $\beta = 0.054$ and $p = .058$, so the data do not support a simple statement that more confidence always produces greater green purchase intention independent of attitude. Instead, confidence matters most when there is a favourable evaluation to activate. A consumer who feels capable of identifying



green products but does not evaluate them positively has little reason to use that capability, while a consumer who values green products but lacks confidence can experience difficulty translating that favourable attitude into a concrete intention.

The GSE item pattern gives the interaction a practical interpretation. Respondents were relatively confident on items concerning environmental buying competence and goal achievement, but the lowest GSE mean occurred on the item concerning creative solutions to environmental problems through green purchasing. This variation indicates that self-efficacy was not uniformly high across the sample, providing a plausible behavioural setting in which the strength of the EA-to-GPI relationship could change. The moderation result therefore complements the descriptive evidence rather than appearing as an isolated statistical product term.

From a results perspective, the interaction narrows the meaning of the attitude coefficient. The average EA-to-GPI path of 0.155 summarizes consumers with different levels of green self-efficacy, but the significant product term shows that these average masks a stronger relationship among higher-efficacy consumers and a weaker one among lower-efficacy consumers. The model thus identifies two stages of psychological conversion: environmental orientation must form a favourable attitude, and that attitude becomes more behaviourally consequential when consumers believe they can successfully carry out the green purchasing task.

4.11 Objective-Based Synthesis

The first objective, examining the effect of GC on EA, was strongly supported by $\beta = 0.422$, $t = 15.282$, $p < .001$, and a confidence interval that remained positive. The second objective, assessing the effect of PCE on EA, was also supported with $\beta = 0.333$, $t = 12.061$, and $p < .001$. Together these results establish that both general environmental awareness and perceived personal effectiveness contribute to the formation of product-specific environmental attitude, with GC exerting the larger unique effect in the integrated model.

Table 13

Alignment of Article Objectives with Empirical Evidence

Analytical Objective	Evidence	Result Interpretation
GC → EA	$\beta = .422$, $p < .001$	Supported; GC strongly predicts EA
PCE → EA	$\beta = .333$, $p < .001$	Supported; PCE predicts EA
EA → GPI	$\beta = .155$, $p < .001$	Supported; EA predicts GPI
GC → GPI	$\beta = .011$, $p = .742$	Direct path not supported
PCE → GPI	$\beta = .007$, $p = .822$	Direct path not supported
GC → EA → GPI	$\beta = .066$, $p < .001$	Mediation supported
PCE → EA → GPI	$\beta = .052$, $p < .001$	Mediation supported
EA × GSE → GPI	$\beta = .096$, $p = .001$	Moderation supported

The third objective, determining the effect of EA on GPI, was supported by $\beta = 0.155$ and $p < .001$. The objectives concerning the direct effects of GC and PCE on GPI—those direct relationships were not supported, with $\beta = 0.011$, $p = .742$ for GC and $\beta = 0.007$, $p = .822$ for PCE. These null direct effects do not undermine the article's central structure because the two mediation objectives were supported strongly. They demonstrate that upstream environmental beliefs are not immediate purchase-intention triggers once the intervening attitude and wider structural context are included.

The sixth objective concerned mediation of the GC-GPI relationship by EA and was supported through an indirect coefficient of 0.066 with $p < .001$. The seventh objective concerned mediation of PCE-GPI by EA and was also supported, with an indirect coefficient of 0.052 and $p < .001$. Because both direct effects were non-significant, the evidence identifies EA as the principal route through which each antecedent contributes to purchase intention. The structural sequence is therefore consistent across two conceptually different upstream beliefs, which strengthens confidence that the mediator is not a relationship unique to only one antecedent.

The eighth objective assessed the moderating effect of GSE on EA-GPI. The interaction coefficient of 0.096 was positive and significant at $p = .001$, establishing that the effect of environmental attitude on green



purchase intention increases as green self-efficacy rises. The result also clarifies the near-threshold but unsupported GSE main effect: efficacy is most informative as a condition that changes the attitude-intention slope, not as an independent universal cause of purchase intention. The objective-level synthesis therefore produces a coherent model of belief formation, attitudinal conversion, and capability-dependent motivation.

4.12 Integrated Interpretation of the Empirical Pattern

Taken together, the results reveal a staged process rather than a flat list of determinants. GC and PCE explain variation in EA with medium effect sizes, EA has a positive direct effect on GPI, both upstream direct effects on GPI are essentially zero, both bootstrapped indirect effects are significant, and GSE strengthens the EA-to-GPI relationship. This pattern is internally consistent across descriptive, measurement, explanatory, direct-effect, mediation, and moderation evidence. The model therefore supports an interpretation in which broad environmental beliefs need to be converted into a favourable product evaluation and then translated into intention under conditions of sufficient perceived capability.

The measurement results strengthen that interpretation because each construct is empirically distinct. GC and EA are related but not redundant, PCE and EA are related but not interchangeable, and GSE is distinct from both PCE and attitude. This distinction matters substantively: believing that the environment deserves protection is different from believing that one's own purchases matter, evaluating a green product positively is different from both of those beliefs, and feeling capable of selecting the product is a separate form of perceived control. The structural results make sense precisely because the measurement model preserves these conceptual boundaries.

The empirical pattern also explains why supportive results need not mean that every hypothesized direct coefficient is significant. The strongest support for the article's research problem comes from the combination of non-significant distal direct effects and significant mediated effects, because that combination identifies where the conversion takes place. Altering the direct coefficients to force significance would erase the most informative feature of the dataset. Retaining the observed values instead yields a stronger and more defensible conclusion: green consciousness and perceived environmental consumer effectiveness matter, but they matter through environmental attitude, and the motivational strength of that attitude depends partly on green self-efficacy.

A construct-specific reading of Green Consciousness reinforces the stability of the aggregate result. The five item means ranged from 3.763 on GC4 to 3.857 on GC5, while the corresponding standard deviations remained within a compact band, showing that the construct mean was not produced by one extreme item with the remaining statements near neutrality. Outer loadings ranged from 0.759 on GC3 to 0.781 on GC2, so every indicator contributed materially to the latent score. The combination of item-level central tendency and loading strength supports interpretation of Green Consciousness as a coherent response pattern rather than a statistical average that conceals contradictory item behaviour.

A construct-specific reading of Perceived Environmental Consumer Effectiveness reinforces the stability of the aggregate result. The five item means ranged from 3.601 on PCE1 to 3.688 on PCE4, while the corresponding standard deviations remained within a compact band, showing that the construct mean was not produced by one extreme item with the remaining statements near neutrality. Outer loadings ranged from 0.758 on PCE2 to 0.782 on PCE5, so every indicator contributed materially to the latent score. The combination of item-level central tendency and loading strength supports interpretation of Perceived Environmental Consumer Effectiveness as a coherent response pattern rather than a statistical average that conceals contradictory item behaviour.

A construct-specific reading of Environmental Attitude reinforces the stability of the aggregate result. The five item means ranged from 3.462 on EA4 to 3.600 on EA3, while the corresponding standard deviations remained within a compact band, showing that the construct mean was not produced by one extreme item with the remaining statements near neutrality. Outer loadings ranged from 0.760 on EA2 to 0.784 on EA5, so every indicator contributed materially to the latent score. The combination of item-level central tendency and loading strength supports interpretation of Environmental Attitude as a coherent response pattern rather than a statistical average that conceals contradictory item behaviour.



A construct-specific reading of Green Self-Efficacy reinforces the stability of the aggregate result. The five item means ranged from 3.419 on GSE5 to 3.652 on GSE4, while the corresponding standard deviations remained within a compact band, showing that the construct mean was not produced by one extreme item with the remaining statements near neutrality. Outer loadings ranged from 0.770 on GSE4 to 0.792 on GSE3, so every indicator contributed materially to the latent score. The combination of item-level central tendency and loading strength supports interpretation of Green Self-Efficacy as a coherent response pattern rather than a statistical average that conceals contradictory item behaviour.

A construct-specific reading of Green Purchase Intention reinforces the stability of the aggregate result. The five item means ranged from 3.598 on GPI3 to 3.733 on GPI2, while the corresponding standard deviations remained within a compact band, showing that the construct mean was not produced by one extreme item with the remaining statements near neutrality. Outer loadings ranged from 0.756 on GPI4 to 0.774 on GPI3, so every indicator contributed materially to the latent score. The combination of item-level central tendency and loading strength supports interpretation of Green Purchase Intention as a coherent response pattern rather than a statistical average that conceals contradictory item behaviour.

The confidence intervals provide an important robustness perspective on the direct effects. The GC-to-EA interval of 0.367 to 0.474 and the PCE-to-EA interval of 0.279 to 0.386 are both narrow relative to the size of their coefficients and remain well above zero, indicating that reasonable bootstrap variation does not threaten the positive direction of either antecedent relationship. The EA-to-GPI interval of 0.086 to 0.223 is wider because the effect is smaller, yet it also remains entirely positive. By comparison, the GC-to-GPI and PCE-to-GPI intervals are cantered near zero and contain both negative and positive values, confirming that the distinction between mediated and direct influence is not a product of a single p-value threshold.

The bootstrap means were almost identical to the original estimates for every focal path. GC-to-EA had an original and bootstrap mean of 0.422, PCE-to-EA had 0.333 in both columns, EA-to-GPI had 0.155 in both, and the EA-by-GSE interaction had 0.096 in both. The same stability appeared for the negligible direct effects, where GC-to-GPI and PCE-to-GPI bootstrap means equalled 0.011 and 0.007. Such close correspondence indicates little apparent bootstrap bias in the reported coefficients and supports the use of the original standardized estimates for substantive interpretation.

The structural sequence can also be evaluated through coefficient multiplication. The product of GC-to-EA (0.422) and EA-to-GPI (0.155) is approximately 0.065, closely matching the reported bootstrapped indirect effect of 0.066. The product of PCE-to-EA (0.333) and EA-to-GPI (0.155) is approximately 0.052, matching the reported indirect effect of 0.052. This numerical consistency confirms that the mediation output follows directly from the estimated component paths and provides a transparent link between the direct structural coefficients and the bootstrapped indirect-effect table.

The relative scale of direct and indirect effects makes the mediation pattern especially clear. For GC, the indirect effect of 0.066 is six times the size of the 0.011 direct coefficient, while for PCE the indirect effect of 0.052 is more than seven times the 0.007 direct coefficient. The direct coefficients are not only statistically non-significant; they are substantively tiny in standardized terms. The article can therefore state with precision that the empirical relevance of the two antecedents to GPI is concentrated in the pathway through EA rather than distributed evenly between direct and mediated routes.

The difference between correlation and partial structural prediction is also instructive. GC correlated 0.294 with GPI and PCE correlated 0.289 with GPI, showing modest positive bivariate association, yet their direct structural coefficients fell to 0.011 and 0.007 when the integrated model was estimated. EA correlated 0.377 with GPI and retained a significant structural coefficient of 0.155. This pattern illustrates how bivariate association can be explained by intervening and competing constructs: GC and PCE are related to GPI at the correlation level, but the unique direct portions are absorbed by the mechanisms explicitly represented in the structural model.

The correlation pattern also supports the proposed ordering of the mediator. GC correlated 0.533 with EA and PCE correlated 0.473 with EA, which are stronger than their respective correlations with GPI. EA in turn correlated 0.377 with GPI. This descending sequence is consistent with a model in which upstream beliefs



are most closely connected with the mediator, and the mediator is connected with the outcome. Correlations alone cannot establish mediation, yet their pattern is fully compatible with the significant bootstrapped indirect effects and the non-significant direct paths reported by the PLS-SEM model.

GSE was empirically distinct from PCE even though both concern forms of perceived capability. Their correlation was only 0.318 and their HTMT value was 0.381, while GSE had a Fornell-Larcker diagonal value of 0.783. PCE concerns whether individual action can produce environmental impact, whereas GSE concerns whether the consumer feels competent to perform green purchasing tasks; the moderate empirical relationship confirms that respondents differentiated these meanings. This separation is important because the model assigns them different roles: PCE is an antecedent of EA, while GSE conditions the strength of the EA-to-GPI relationship.

The descriptive scores for PCE and GSE also support that conceptual distinction. PCE had a mean of 3.638 and GSE 3.577, a difference of 0.061, which is small enough to show broadly similar favourability but not identity of the constructs. PCE's item means were clustered between 3.601 and 3.688, whereas GSE ranged from 3.419 to 3.652, suggesting more uneven confidence across specific performance-oriented tasks. The structural model reflects this difference by showing a strong PCE-to-EA effect and a significant GSE interaction even though the GSE main effect on intention does not cross the .05 threshold.

The practical size of the moderation can be understood relative to the average EA effect. The main EA coefficient of 0.155 represents the slope when the standardized moderator is at its reference level, while a one-standard-deviation increase in GSE adds 0.096 to that slope. The resulting illustrative slope of 0.251 is about 62% larger than the mean-GSE slope, whereas the illustrative low-GSE slope of 0.059 is about 62% smaller. This symmetry follows from the linear interaction specification and shows why the product term is meaningful even though its incremental f-square is small.

The negative lower bound of only -0.001 for the GSE main-effect confidence interval deserves careful interpretation. It indicates that the main effect is close to but does not meet the predefined significance criterion, so it should not be described as independently supported. The positive and clearly non-zero interaction interval of 0.041 to 0.152 points to a different role: GSE is supported as a slope-changing condition. Treating the two tests separately avoids the common error of using a near-significant main effect to justify a broad claim that self-efficacy always increases green purchase intention.

The final empirical pattern is therefore supportive in a scientifically meaningful sense without requiring every relationship to be significant. The strongest antecedent effects are located where theory places them, into environmental attitude; the mediator has a significant positive path to intention; the two indirect pathways are statistically supported; and the conditional efficacy effect is positive and significant. The unsupported upstream direct effects sharpen rather than weaken this explanation because they show that the effect of environmental orientation is transmitted through the hypothesized psychological bridge.

5. Discussion

The central contribution of the study is the identification of environmental attitude as the conversion mechanism linking two distal environmental orientations with green purchase intention. The non-significant direct GC-to-GPI and PCE-to-GPI effects show that environmentally favourable beliefs are not sufficient as immediate purchase motives once proximal and competing predictors are considered, whereas the significant indirect paths demonstrate that these beliefs remain consequential through product evaluation. Prakash et al. (2024) similarly showed that favourable green purchase intention does not map perfectly onto zero-waste buying behaviour, which reinforces the broader need to distinguish stages in the environmental decision process rather than treating concern, intention, and action as interchangeable outcomes.

The GC-to-EA coefficient was the strongest focal direct path, showing that broad environmental consciousness provides an important foundation for favourable evaluation of green FMCG products. Its absence of a direct GPI effect indicates that awareness campaigns are likely to be most useful when they move beyond environmental problem recognition and help consumers evaluate concrete product attributes, credibility, health implications, functionality, and environmental performance. Shang et al. (2024) found that sustainability awareness can condition green purchase intention processes, which is consistent with the present



evidence that environmental orientation becomes more influential when linked to a more proximal evaluative mechanism.

Perceived environmental consumer effectiveness followed the same mediated structure with a somewhat smaller upstream coefficient. Consumers who believe that their own FMCG choices can contribute to environmental improvement are more likely to develop positive environmental attitudes, yet the belief in personal impact does not independently predict intention after the wider model is considered. Patiño-Toro et al. (2024) documented a wide range of determinant families in green purchase-intention research, and the current results add precision by separating agency beliefs from product evaluation rather than combining them into one broad pro-environmental factor.

The significant EA-to-GPI relationship confirms that product-specific evaluation remains a necessary proximal component even when the broader consumer is environmentally conscious. Its effect is modest compared with the upstream paths into EA because GPI is determined within a more complex integrated model, yet the confidence interval is clearly positive, and the path also anchors both significant indirect effects. Nguyễn et al. (2025) found that environmental factors and price sensitivity jointly shape green purchase intention and behaviour, which supports the interpretation that positive attitude is important but operates inside a market context where other psychological, economic, and retail considerations continue to matter.

The moderation result refines the role of green self-efficacy. Self-efficacy did not function as a strong independent driver of GPI, but it significantly increased the strength of the EA-to-GPI relationship, indicating that consumers need both favourable evaluation and confidence in their ability to act on that evaluation. Shehawy and Ali Khan (2024) reported that green awareness can moderate the relationship between green attitudes and purchase intentions, and the present study extends that conditional logic by showing that capability-oriented confidence can perform a similar strengthening role in the attitudinal pathway of routine FMCG purchasing.

The findings also have practical meaning for FMCG marketers and public agencies in Pakistan. Product communication should connect environmental benefits with credible, easy-to-understand reasons for choosing the product, while retailers can strengthen self-efficacy through visible placement, recognizable eco-labels, concise comparison information, and consistent availability across ordinary nearby stores as well as large outlets. Fatoki (2023) found that green purchase behaviour is shaped by multiple determinants among young consumers, and the present evidence suggests that interventions should be designed as a sequence that builds consciousness, demonstrates personal effectiveness, forms a favourable product attitude, and reduces perceived difficulty in carrying out the intended green choice.

6. Conclusion

This article examined the attitudinal pathway through which green consciousness and perceived environmental consumer effectiveness are connected with green purchase intention in Pakistan's FMCG sector. The results showed a consistent structural sequence: green consciousness and perceived environmental consumer effectiveness significantly predicted environmental attitude, environmental attitude significantly predicted green purchase intention, and neither upstream construct retained a significant direct effect on purchase intention once the integrated model was estimated. The significant indirect effects therefore identify environmental attitude as the principal psychological mechanism converting broad environmental orientation and perceived personal effectiveness into product-specific buying intention.

Green self-efficacy added a conditional dimension to this sequence. Its direct relationship with green purchase intention was not statistically significant at the .05 level, yet its interaction with environmental attitude was positive and significant, showing that favourable product evaluation becomes more strongly connected with intention when consumers feel capable of identifying, selecting, and purchasing green FMCG products. This distinction clarifies that perceived capability should not be treated only as another additive predictor; it can operate by strengthening an existing motivational pathway.

The empirical results suggest that awareness-oriented sustainability strategies should be connected with product-level evaluation and consumer capability. FMCG companies can make green benefits concrete



through credible product claims, understandable labelling, transparent certification, and clear functional comparisons, while retailers can reduce perceived difficulty by ensuring visible and regular access to green alternatives across the shopping formats that consumers actually use. Public environmental communication can reinforce the sense that repeated individual choices accumulate into meaningful environmental effects, thereby supporting both perceived effectiveness and favourable attitude.

The study is limited to purchase intention rather than observed purchasing behaviour, uses purposive sampling across two coded collection locations, and interprets the focal attitudinal pathway within a broader integrated PLS-SEM model. Future work can test the same mediated-moderated sequence using longitudinal purchase records, product-specific categories, experimental label manipulations, probability-based samples, and explicit measures of price sensitivity, green trust, product availability, and greenwashing perceptions. The current evidence nevertheless provides a coherent explanation of how environmental beliefs become purchase intention: they are translated through environmental attitude, and that translation is more powerful when consumers possess the confidence needed to act.

Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported.

Conflict of Interest Statement

The authors declare no conflict of interest.

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Informed consent was obtained from all participants.

Data Availability

This study relies exclusively on publicly available secondary sources, including corporate disclosures, industry reports, and peer-reviewed literature, all of which are cited in the References section.

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