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# A Meta-Analytic Review of the Relationship Between Environmental Dimensions of ESG Management and Purchase Intentions in South Korea

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## ABSTRACT

The importance of corporate environmental stewardship has been diversely emphasized, but recently, under the environmental, social, and governance (ESG) paradigm, environmental practices for corporates sustainability have been more dominant. However, few researchers have comprehensively examined how ESG environmental practices affect consumer behavior, so we estimated the effect size of the association between environmental dimension of ESG management and consumer purchase intentions. Given that South Korea is one of the countries where ESG is gaining importance, we targeted and collected journal papers and dissertations published in South Korean databases until March 2024. Among the collected materials, we selected 21 academic papers ($n$=6399) that met the criteria for final analysis. After estimating the entire effect size of ESG environmental practices via a random effects model, we found the effect size of the correlation coefficients to be 0.528, which is large. Furthermore, after examining the differences per publication year and between genders, we found that the difference in effect size per publication year was insignificant whereas the effect size was significantly higher when the female rate was higher. The findings of the study provide empirical evidence on the positive impact of corporates' environmental practices under ESG on consumer purchase intentions. This study is useful as a rationale for why and how both corporations and policymakers should effectively develop and support environmental practices within the ESG framework.

## 1 | Introduction

Environmental issues have become an essential consideration for corporations attempting to achieve sustainability in the implementation process of environmental, social, and governance (ESG) management. ESG is an investing principle that corporations should prioritize in their responsibilities not only to shareholders but also to environmental issues, social issues, and corporate governance for the common good (Billio et al. 2021; Gillan et al. 2021). As it has gained traction, ESG has been understood as an indicator of corporate nonfinancial performance (Galbreath 2013) and as a key criterion to be considered for corporate investment decisions (Yoon et al. 2018).

Indeed, ESG concepts are now being actively utilized as a basis for investment decision-making across corporate operations, and their importance has been emphasized globally as ESG has become an integral part of corporate sustainability (Li et al. 2021; Senadheera et al. 2022). Although each element of ESG is important, the environmental dimension has gained

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more importance and greater public attention because of the severe environmental issues appearing around the world and the higher sense of urgency due to unpredictable climate change effects. Consumers place importance on corporate environmental responsibility and are willing to purchase products from companies that value environmental responsibility, whereas they tend to boycott companies engaging in environmentally irresponsible behavior that has a negative impact (Lin et al. 2016). The environmental dimension of ESG management has thus become an essential strategy for companies trying to meet social and global sustainability needs and avoid a negative reputation in the market.

Due to the increasing importance of ESG in corporate management, several researchers have investigated the impact of ESG management on profitability and corporate risk as well as the impact of ESG management on consumer behavior. Existing researchers have attempted to identify the effects of ESG management on financial performance (Alsayegh et al. 2020; Khan 2022; Kim and Li 2021; Singhania and Gupta 2024; Velte 2017; Zhang and Liu 2022). However, the results of individual studies have shown the inconsistency of the impacts of ESG on corporate performance (Khan 2022; Singhania and Gupta 2024).

Meanwhile, a growing number of researchers have recently attempted to examine the impacts of ESG environmental management on consumer behavior and responses, given that consumers are one of the key stakeholders of corporations (Bae et al. 2023; Koh et al. 2022; Lee and Rhee 2023; Tripopsakul and Puriwat 2022). However, the impact of ESG environmental management on consumer behavior and responses is still under discussion because researchers still report inconsistent results in individual studies and none has yet conducted a meta-analysis to synthesize them.

South Korea is one of the countries that has actively reacted to the ESG issue and thus, in all industries, social pressures toward ESG management implementation have been emphasized. According to the K-ESG guideline that the South Korea government has developed regarding the industry context of the society, major enterprises have declared ESG-related policies and goals and have established dedicated organizations and systems to promote ESG in their affiliates in Korea (Ministry of Trade, Industry and Energy, and Korea Productivity Center, 2021). Specifically, the Korean government has supported corporations' ESG environmental practices. The rate of government funding on environmental protection activities has always been more than 2% since 2012, reaching 2.77% in 2021 (STATISTA 2023). In addition to government investment, regulations on ESG environmental management have been strengthened. Korea Composite Stock Price Index-listed firms with total assets of more than KRW 1 trillion are obligated to report environmental information under the Environmental Technology and Industry Support Act since 2022 (Asia Business Law Journal 2023).

However, corporations can merely be involved in ESG management in a superficial and fragmentary way if it is unclear how political and social support and interest in ESG actually links to corporate performance. Therefore, it is crucial to identify empirically how ESG management activities, specifically environmental management, are translatable into stakeholders' responses. In particular, research on the effect of ESG environmental management on consumer decision-making, a key stakeholder that directly affects a company's reputation and performance, is essential.

Given this background, we pose the following research questions:

> RQ1. What is the effect size of the correlation coefficients of the relationship between perceived corporate ESG environmental practices and purchase intention?

> RQ2. How does the effect size of the relationship between perceived corporate ESG environmental practices and purchase intention change per publication year?

> RQ3. How does the effect size of the relationship between perceived corporate ESG environmental practices and purchase intention vary per gender?

> RQ4. How does the effect size of the relationship between perceived corporate ESG environmental practices and purchase intention vary by age?

## 2 | Literature Review

### 2.1 | Definition of ESG

The UN Global Compact Initiative coined the term ESG in 2004 with the publication of its *Who Cares Wins* report (United Nations 2004). Because the ESG score has gradually been indicated as a key factor in corporate investment decision-making (Yoon et al. 2018), it has become a paradigm for companies to follow. The "E" represents environmental performance and measures the amount of emissions, pollutants, and natural resources consumed during business practices (Yoon et al. 2018). The "S" refers to social performance and encompasses efforts to respect human rights, improve the quality of employment, and achieve product safety and gender equality, and the "G" refers to governance performance, specifically in relation to rights and responsibilities in corporate governance such as corporate management, shareholder protection, and corruption (De Giuli et al. 2024; Galbreath 2013; Yoon et al. 2018).

South Korea has published its own version, the Korean K-ESG guideline, which designates four categories—public, environmental, social, and governance—by adding an item to evaluate ESG-related information disclosure (Ministry of Trade, Industry and Energy, and Korea Productivity Center 2021). According to the K-ESG guideline 1.0, the main indicators of information disclosure are the format, content, and verification of public disclosure (Ministry of Trade, Industry and Energy, and Korea Productivity Center 2021). Key indicators of the environmental sector include the amount of greenhouse gas emissions, waste generation, and energy usage; indicators of the social sector include human rights, employment quality, gender equality, and



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industry safety; and indicators of the governance sector cover business ethics, protection of shareholder rights, and board of directors' composition (Ministry of Trade, Industry and Energy, and Korea Productivity Center 2021).

Meanwhile, all ESG aspects are important, but the importance of the environmental dimension of ESG has been recently highlighted because the global pandemic and unexpected climate change have impacted human lives. According to a survey conducted by *Seoul Economic Daily* (2022), 72% of corporations that participated in the survey responded that the "E" is the most important sector. It implies that corporations care deeply about the environmental dimension when they implement ESG management.

## 2.2 | Corporations' Environmental Activities of ESG

### 2.2.1 | Literature on ESG Environmental Practices and Corporate Performance

Studies about ESG environmental management mostly fall into two types, depending on whether the researchers investigate corporate performance or consumer response. First, numerous studies have focused on how ESG practices affect corporate performance, but the results have been inconsistent. A great number of individual studies have concentrated on the impact of ESG on financial performance (Kim and Li 2021; Velte 2017; Zhang and Liu 2022). Zhang and Liu (2022) showed that ESG performance improves a firm's financial flexibility. However, several studies have reported mixed results. Kim and Li (2021) found that ESG environmental performance had no significant effect on financial performance (i.e., return on assets), and even had a negative effect on credit rating. Velte (2017) examined listed companies in Germany and reported that ESG environmental management positively influenced return on assets but showed no significant impact on Tobin's Q.

Considering the inconsistent findings from previous studies, several researchers have conducted meta-analyses to identify the overall effects of ESG environmental management on corporate performance after synthesizing previous research (Albertini 2013; Khan 2022; Singhania and Gupta 2024). Albertini (2013) performed a meta-analysis on the impact of environmental management on corporate financial performance, and the results demonstrated that environmental management performance improves corporate financial performance. Khalil et al. (2024) found that environmental innovation positively influenced companies' financial and environmental performance, with carbon emission reductions contributing to their improved financial performance. Singhania and Gupta (2024) performed a meta-analysis on the effect of ESG disclosure on firm risk and found that both ESG disclosure and the individual "E" and "S" disclosures significantly mitigate firm risk. A synthesis of the extant research indicates that ESG is not merely a social responsibility; rather, it has a beneficial impact on financial performance, mitigates corporate risk, and enhances competitiveness. However, it is only a result limited to shareholder- or investor-centered financial performance. It does not reflect consumers' perception and evaluation, even though consumers are a cruical stakeholder group that shapes corporations' performance and reputation.

### 2.2.2 | ESG Environmental Practices and Consumer Behavior

Recently, a few studies have looked at the effect of ESG on consumer behavior. (Bae et al. 2023; Lee and Rhee 2023; Khalil and Khalil 2022; Koh et al. 2022; Tripopsakul and Puriwat 2022). However, the results of these individual studies are still inconsistent. Some researchers have reported that ESG environmental management has a positive impact on consumer behavior. For instance, Bae et al. (2023) investigated food and beverage companies and reported that ESG environmental practices have a positive impact on word of mouth and brand trust. Tripopsakul and Puriwat (2022) surveyed Thai consumers and confirmed that ESG environmental management has a significantly positive impact on brand trust and customer engagement. Khalil and Khalil (2022) examined the relationship between sustainability practices and impulse buying and showed that the awareness of environmental sustainability positively increases green trust, and green trust has a positive impact on impulse buying. However, a few studies have shown different results. For instance, according to Lee and Rhee (2023), the social and governance activities of ESG management exert a positive impact on behavior and brand image, whereas environmental activities do not have a significant effect on brand image, behavior, or attachment. Likewise, Koh et al. (2022) examined the impact of perceived ESG on consumer responses and found that ESG environmental management has no significant impact on perceived quality, brand image, or brand credibility. The disparate outcomes observed indicate that the impact of ESG on consumer behavior is complicated and may fluctuate, contingent upon cultural background, industry, and other factors.

As indicated so far, in individual studies that have examined consumer responses, researchers have reported varying results on the influence of ESG environmental management on consumer behavior, making it difficult to identify the impact clearly. Especially considering the growing importance of ESG principles in Korean society, a clearer understanding of whether the expansion of ESG environmental management has had a positive impact on corporate sustainability is necessary. In this sense, a comprehensive analysis of previous research results is critical to understand better the influence of ESG environmental practices on consumer behavior. However, to date, such comprehensive studies are rare. Therefore, in this study we aim to determine the actual magnitude of the effect of ESG environmental practices on consumer behavior using meta-analysis.

## 2.3 | Pro-Environmental Consumption and Gender, Publication Year, and Age

Researchers who have examined green consumption have reported differences in consumer behavior based on gender and year of publication. Researchers who have examined gender differences in green consumption have revealed that women tended to be more concerned about the environment (Gökmen 2021; Zelezny et al. 2000). Gökmen (2021) demonstrated the



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effect of gender on environmental attitudes in a meta-analysis, showing that women have more positive and sensitive attitudes toward the environment compared to men. Zelezny et al. (2000) reviewed the literature and found that women have higher levels of eco-friendly attitudes and behaviors. Based on these findings, we hypothesize that the relationship between ESG environmental management and consumer purchasing behavior may differ by gender.

In addition, researchers in some environmental meta-analyses have found that publication year has a moderating effect. Hurst et al. (2013) conducted a meta-analysis investigating the link between materialistic values and both environmental attitudes and behaviors and found significant negative associations. They also found that year of publication moderated the association between materialistic values and attitudes but not behaviors. Specifically, the relationship between materialism and environmental attitudes was less negative the more recent the publication year. In addition, society has emphasized the importance of ESG in recent years, resulting in stronger government policies in Korea. Concurrently, the quality and accessibility of ESG-related information available to consumers has improved, given the standardization of reporting, such as corporate ESG disclosures. Given this, we expect that consumers would trust ESG information and be more likely to make purchasing decisions based on it. Accordingly, we hypothesize that the year of publication may moderate the link between ESG and consumption behavior.

Researchers have studied age as one of the main variables that influence consumers' attitudes and behavior toward companies' environmental protection activities (Puriwat and Tripopsakul 2023; Sawicka and Marcinkowska 2022). Sawicka and Marcinkowska (2022) compared the evaluation results of four age groups (Generation X, Y, Z, and baby boomers) on various environmental CSR activities of companies and found that Generation Z tended to be more sensitive to companies' green initiatives than other generations did. Puriwat and Tripopsakul (2023) examined the moderating effect of ESG on brand love by dividing the relationship into older and younger groups. The results showed that ESG initiatives had a positive impact on both brand loyalty and brand love. Specifically, the moderating effect of age was confirmed because the positive impact of ESG initiatives on brand love was stronger for younger consumers, but no moderating effect of age on the link between ESG activities on brand loyalty was verified (Puriwat and Tripopsakul 2023). Based on these results, we hypothesize that the effect size of ESG on purchase intention may differ depending on the age of the respondents.

## 3 | Methods

### 3.1 | Data Collection and Search Strategy

We collected the data in 2024 and screened them according to Moher et al.'s (2009) PRISMA guidelines. We targeted studies in which researchers examined the association between corporate ESG practices and consumer purchase behavior published in Korean Citation Index-listed journals in South Korea. We excluded qualitative studies and targeted only quantitative studies using survey methods to synthesize and calculate the effect size from quantitative studies. We did not apply restrictions on the publication year during the research selection process.

The databases used in this study were DBpia and the Research Information Sharing Service (RISS), which are usually utilized in South Korea. The Boolean operators OR and AND were combined with keywords to collect relevant studies. The specific search words were "ESG AND (Consumer OR Customer OR purchase)." In the end, 976 journal articles were collected by using corresponding search words to select academic articles and theses or dissertations from DBpia (348 articles), and RISS (628 articles).

### 3.2 | Inclusion and Exclusion Criteria

We only included studies that satisfied the following criteria: (a) studies that examined ESG and consumption patterns among adult consumers (if fewer than 30% of the participants were teenagers, the studies were considered to target adult consumers); (b) studies that examined ESG environmental practices as an independent variable and consumer purchase intention as a dependent variable; (c) studies that conducted online or offline surveys; (d) articles, theses, or dissertations published in Korean or English; and (e) studies targeting South Korean consumers.

The following cases were excluded (see Figure 1): (a) studies targeting minors; (b) conference proceedings, magazines, or reports; (c) studies with difficult access to their full text; (d) qualitative research such as literature reviews, in-depth interviews, and case studies; (e) studies that used big data analysis; (f) studies without ESG environmental practice variables (e.g., Studies that only addressed CSR were excluded); (g) studies that grouped all ESG management practices as one variable; (h) studies without purchase intention variables (cases that only specified loyalty, behavioral intention, repurchase intention, usage intention, or satisfaction as dependent variables, were excluded); (i) studies that did not target Korean consumers; (j) studies that were difficult to convert to effect size statistics; and (k) studies with inappropriate measurement tools.

### 3.3 | Data Screening

We screened the 976 studies collected according to PRISMA guidelines. First, we excluded 283 duplicate studies collected from multiple databases. Then, we excluded 102 studies that included presentation materials for academic conferences, magazines, and research reports along with 187 studies irrelevant to this study. We also excluded 15 studies that lacked full texts, 57 studies that employed qualitative research methods, and 13 studies that used big data analysis.

Additionally, we excluded 282 studies without ESG environmental practice variables or purchase intentions, seven studies targeting non-Korean consumers, seven studies without statistics for calculating effect size, and one study with inappropriate measurement tools. During the screening process, we first examined the titles and abstracts, and then reviewed the full text if the information from titles and abstracts was insufficient for



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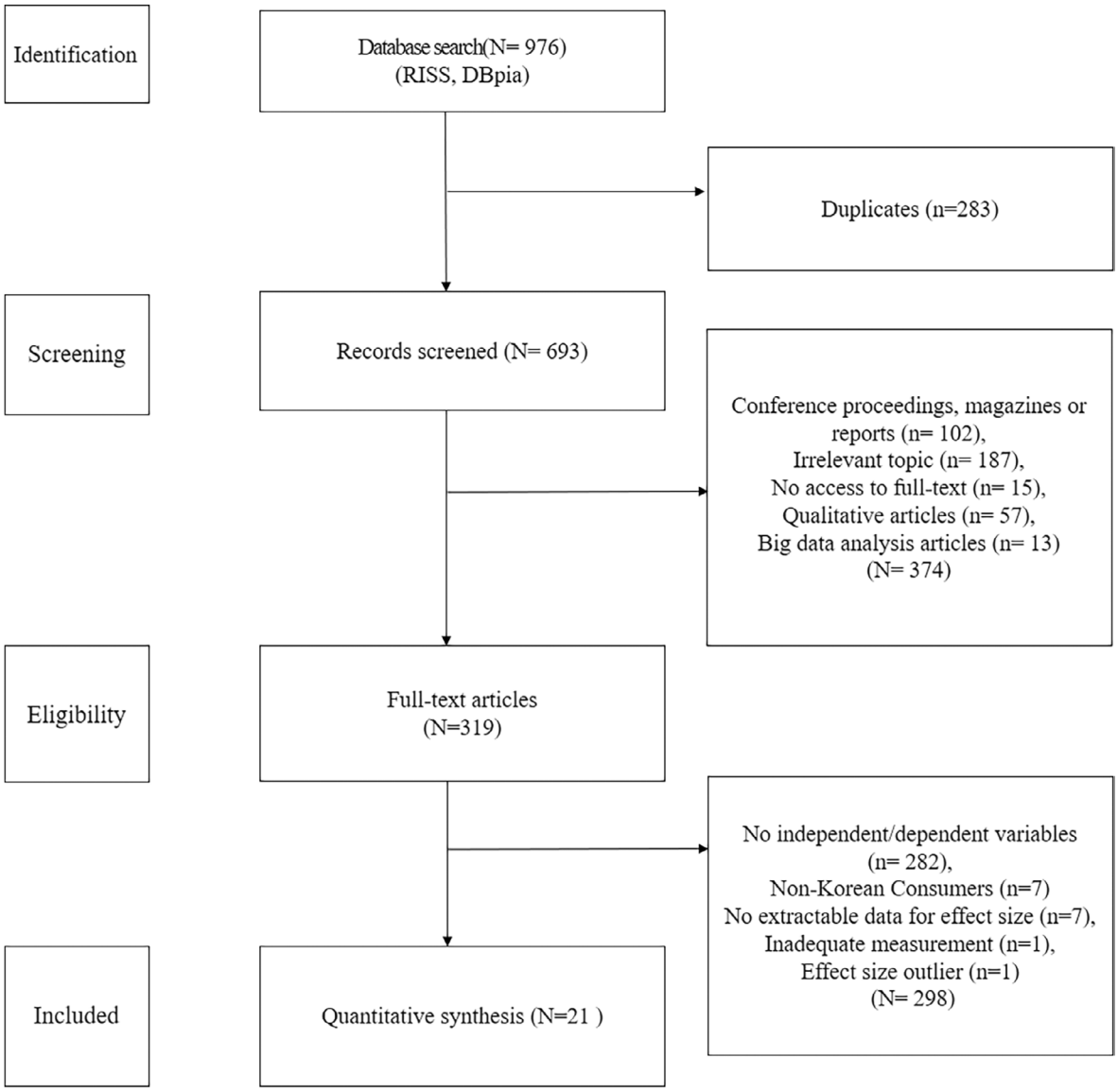



**FIGURE 1** | PRISMA flow chart.

screening. After calculating the effect sizes, we excluded one study with an effect size outlier. Finally, we targeted 6399 participants in 21 studies for analysis.

### 3.4 | Data Extraction (Coding Sheet)

We inputted the main information of the selected studies into a coding sheet. Specifically, we inputted the following information: title of study, author, country, study design (survey), company field, characteristics of consumers (gender [%]), publication year, and proportion of 20–30-year-olds[1] (Table 1).

### 3.5 | Data Synthesis and Data Analysis

To integrate the effect sizes, we utilized the correlation coefficient r as a common effect size. To this end, we extracted the correlation coefficients between environmental variables of ESG practices and purchase intention and the number of samples from the studies with survey methods and entered them into the coding sheet. We converted the extracted correlation coefficients to Fisher's Z for normality and then converted back to the correlation coefficient r for the convenience of interpretation. For calculating the effect size, we performed a meta-analysis with the R program version 4.3.3. We calculated the effect size of the correlation coefficient based on the effect sizes of correlation coefficients suggested by Cohen (1988); based on 0.1, 0.3, and 0.5, they were judged as small, moderate, and large.

### 3.6 | Heterogeneity and Moderator Analysis

We applied $Q$ statistics and $I^2$ to determine heterogeneity. According to Higgins and Green (2011), if the $p$-value of the $Q$ statistic is less than 0.1 and $I^2$ is higher than 50%, the heterogeneity is considered significant. We conducted a moderating effect analysis to identify the cause of significant heterogeneity. If a moderating variable was a categorical variable, we applied a meta-ANOVA, and if it was a continuous variable, we performed a meta-regression analysis.



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**TABLE 1** | Key features of the final selected studies.

| No. | Author (year) | Country | Company field | Method | Gender | Female ratio | Proportion of 20–30–year–olds |
|---|---|---|---|---|---|---|---|
| 1 | Park and Seo (2023) | South Korea | Food service | Survey | Male/Female | 46.7 | 47.3 |
| 2 | Choi and Kim (2023) | South Korea | Beauty industry | Survey | Male/Female | 81.5 | 69.5 |
| 3 | Ji and Seo (2023) | South Korea | General consumer goods | Survey | Male/Female | 50.7 | 49.4 |
| 4 | Ji and Seo (2021) | South Korea | General consumer goods | Survey | Male/Female | 52 | 49.2 |
| 5 | Kim et al. (2023) | South Korea | Financial company | Survey | Male/Female | 45.9 | 27.2 |
| 6 | Lee and Park (2023) | South Korea | Public interest marketing companies and consumer goods | Survey | Male/Female | 56.2 | 51.8 |
| 7 | Seo et al. (2022) | South Korea | Small or medium enterprises | Survey | Male/Female | 50 | 40.2 |
| 8 | Lee et al. (2023) | South Korea | Food | Survey | Male/Female | 51.7 | 52.6 |
| 9 | Chang and Lim (2023) | South Korea | Cosmetics | Survey | Male/Female | 52.6 | 79.1 |
| 10 | W. K. Choi (2023) | South Korea | Food, automobile, or electronics | Survey | Male/Female | 50 | 53 |
| 11 | Kwak (2022) | South Korea | Cosmetics, foods, electronics, etc. | Survey | Male/Female | 65.2 | 41.1 |
| 12 | Koh (2022) | South Korea | Online platforms and offline hypermarkets | Survey | Male/Female | 51.3 | 42.8 |
| 13 | S. J. Jang (2023) | South Korea | IT platform companies | Survey | Male/Female | 75.5 | 90.8 |
| 14 | Lee and Yoon (2023) | South Korea | n/a | Survey | Male/Female | 25.9 | n/a |
| 15 | Lim et al. (2023) | South Korea | Cosmetic companies | Survey | Male/Female | 56.3 | n/a |
| 16 | Yoon (2024) | South Korea | Large companies in South Korea (companies with best ESG practices) | Survey | Male/Female | 54.3 | 46.1 |
| 17 | E. K. Jang (2024) | South Korea | Korea's 3 big supermarkets and department stores | Survey | Male/Female | 49.3 | 46.3 |
| 18 | S. R. Choi (2024) | South Korea | Aviation, food, and distribution | Survey | Male/Female | 57.7 | n/a |
| 19 | Kim (2024a) | South Korea | Cosmetic companies | Survey | Male/Female | 58.1 | n/a |
| 20 | Kim (2024b) | South Korea | Jewelry industry | Survey | Male/Female | 54.4 | 40.7 |
| 21 | Kang (2022) | South Korea | Fashion companies | Survey | Male/Female | 49.4 | 48.8 |



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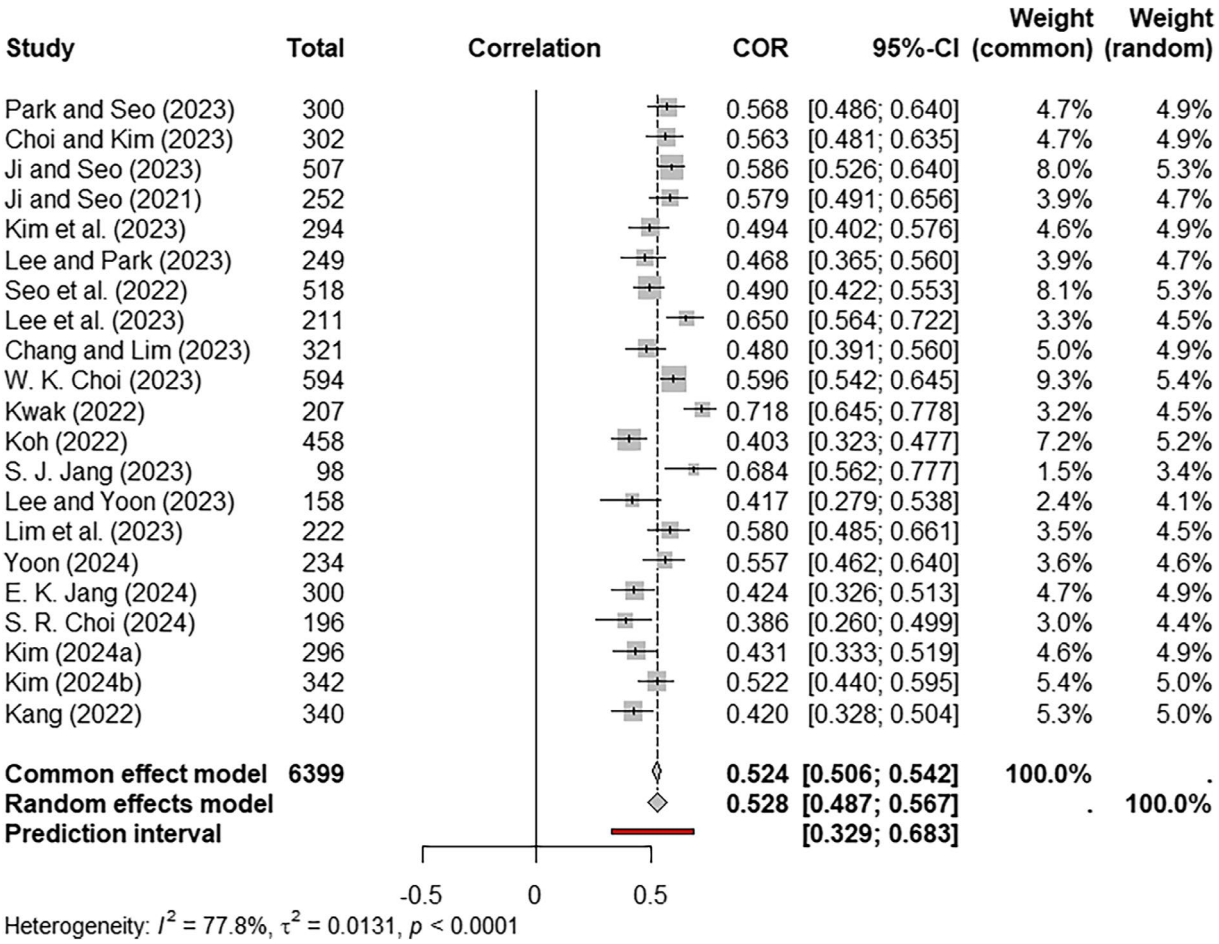



**FIGURE 2** | Forest plot.

### 3.7 | Outliers

After calculating the pooled effect sizes of the studies for the final analysis, we confirmed outliers by using the box plot suggested by Tukey (1977), according to which quartiles and interquartile ranges (IQRs) are useful in finding the lower and upper fences. The IQR is determined by subtracting Q1 value from Q3 value. The lower fence is obtained by subtracting the value of 1.5 times the IQR from Q1, while the upper fence is found by adding the value of 1.5 times the IQR to Q3 (Hoaglin et al. 1986). Values that do not fall within these lower and upper fences are considered outliers. In this study, we used Fisher's $Z$, which assumes normality, to calculate this. As a result, we assumed one study (Jung 2023) to be an outlier and excluded it.

## 4 | Results

### 4.1 | Pooled Effect Size

We conducted the following meta-analysis to confirm the effect sizes of the ESG environmental management of companies while targeting consumers. Because there were differences in the population and analysis methods among individual studies, we selected the random effects model as the research model. The results revealed that the effect size of 21 studies based on the random effects model was 0.528, and there was a significant relationship between ESG environmental management and purchase intentions (95% CI = [0.487, 0.567]) (see Figure 2 and Table 2). As a result, the overall effect size was 0.528, which we found to be a large effect size according to Cohen (1988). The $Q$ value was 90.24 ($p < 0.0001$), and the $I^2$ value was 77.8%, confirming that the heterogeneity of the overall effect size was significant (Higgins and Green 2011). In other words, there was a wide variation between studies. These results suggest that the more consumers perceive a company to be performing well on ESG environmental management, the more it positively affects their purchase intention. We attribute the high degree of heterogeneity to differences in the ESG industry as well as in the gender ratio, age of participants, and year of publication. In this study we focused on gender ratio, the proportion of 20–30-year-olds, and year of publication because this is information that can be clearly collected and distinguished in the final study population. We were unable to examine other moderating effects because of mixed content, such as a mix of ESG industry types in one study.

### 4.2 | Moderator Analyses

#### 4.2.1 | Meta-ANOVA

We conducted a moderating effect analysis to identify the cause of heterogeneity among the studies, and the results appear in Table 3. We found that the difference in effect size per publication year was insignificant at $p > 0.05$ ($Q_b = 3.40$, df($Q$) = 3, $p = 0.334$). The



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**TABLE 2** | Results of effect size.

| | | | 95% CI | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ***N*** | ***ESr*** | **Lower** | **Upper** | $I^2$ | ***Q*** | **df(*Q*)** | ***p*** |
| Fixed-effects model | 21 | 0.524 | 0.506 | 0.542 | 77.8% | 90.24 | 20 | < 0.0001 |
| Random-effects model | 21 | 0.528 | 0.487 | 0.567 | | | | |

*Note:* Number of participants = 6399, *N* = number of studies, *ESr* = Pearson correlation coefficient effect size.

**TABLE 3** | Moderator analysis results.

| | **Categorical moderators** | ***k*** | ***ESr*** | **95% CI lower** | **95% CI upper** | $Q_b$ | **df(*Q*)** | ***p*** |
|---|---|---|---|---|---|---|---|---|
| Publication year | 2021 | 1 | 0.579 | 0.386 | 0.724 | 3.40 | 3 | 0.334 |
| | 2022 | 4 | 0.513 | 0.417 | 0.598 | | | |
| | 2023 | 11 | 0.556 | 0.501 | 0.607 | | | |
| | 2024 | 5 | 0.467 | 0.375 | 0.551 | | | |

results of this study show that the effect size of ESG environmental management on purchase intentions does not differ by publication year. This suggests that ESG is not a recent trend, but rather already an important criterion for consumers and the magnitude of the change has not been significant. The results of this study suggest that the impact of ESG on purchase intention may be more dependent on other factors, such as product type and industry, and that future research is necessary.

#### 4.2.2 | Meta-Regression Analysis

In this study, we also performed a meta-regression analysis based on the female rate to determine the change in the size of the effect of ESG environmental management per gender. We selected the random effects model as the research model after considering the differences between the studies. As a result, we found gender to be a significant moderating variable between ESG environmental management and purchase intentions ($\beta = 0.0053$, $p = 0.0463$). In other words, as the female rate increases, the effect size increases accordingly. This finding suggests that ESG environmental management activities are more likely to influence women, and companies will be better served by adapting their strategies to target women with ESG environmental management.

We also conducted a meta-regression analysis using a random-effects model based on the proportion of 20–30-year-olds to examine whether the effect size varied depending on the proportion of the age group. We used the proportion of 20–30-year-olds because of the difficulty in obtaining average age data in each study and excluded four studies that did not present the proportion of each age group, leaving a total of 17 studies for analysis. The excluded studies were Lee and Yoon (2023), Lim et al. (2023), S. R. Choi (2024), and Kim (2024a; see tab. 1). The meta-regression analysis revealed that the difference in effect sizes of ESG environmental management on purchase intention according to the proportion of 20–30-year-olds was not significant ($\beta = 0.0022$, $p = 0.334$). This result indicates that the proportion of 20–30-year-olds does not moderate the link between ESG environmental management and purchase intention, which indicates that the relationship between ESG environmental management and purchase intention is neither stronger nor weaker when the proportion of 20–30-year-oldsis higher.

### 4.3 | Publication Bias

We employed an Egger's regression analysis to statistically test for publication bias (see Figure 3). The results were as follows: $t = 0.65$, and $p = 0.526$, so the association between the effect size and the standard error was not statistically significant. This implies there was no publication bias.

We also performed trim-and-fill analysis to verify the effect of publication bias (see Figures 4 and 5). As a result, no additional studies were added, and the estimate calculated from a total of 21 studies was as follows: $ESr = 0.528$ (95% CI = [0.487, 0.567], $Q(20) = 90.24$, $p < 0.0001$). This is the same value as the original effect size value. This result means that no research was excluded from the meta-analysis because of publication bias.

## 5 | Discussion

In this study, we aimed to identify the relationship between corporate ESG environmental management and consumer purchase behavior. To this end, we performed a meta-analysis of the responses of 6,399 consumers from 21 studies and examined the moderating effects of publication year, gender, and age.

### 5.1 | Association Between ESG Environmental Management and Purchase Intentions

The effect size of the link between ESG environmental practices and consumer purchase intention was 0.528, which is a large effect size. This result suggests that the more consumers perceive a company's ESG environmental practices to be good, the more it tends to influence consumer purchase intentions positively. Because increased consumer purchases lead to higher sales for companies, this suggests that ESG environmental practices are a critical part of sustainable corporate management. Previous meta-analyses of



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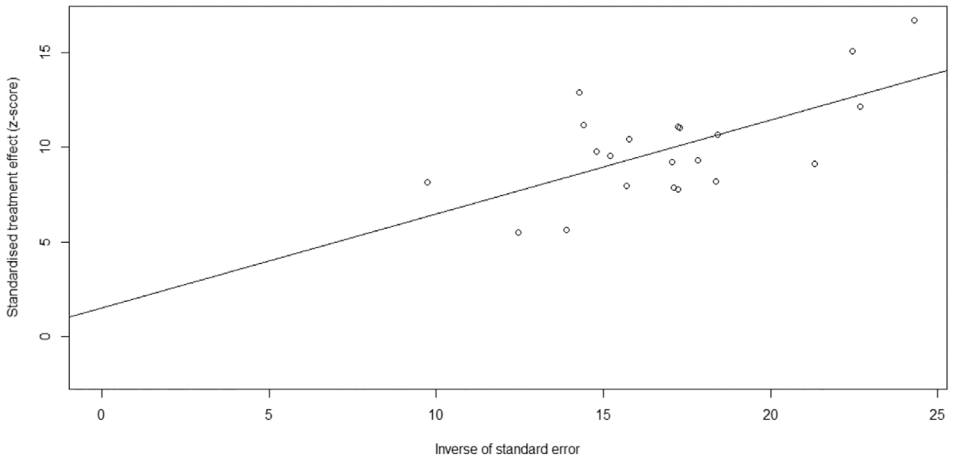



**FIGURE 3** | Result of Egger's test.

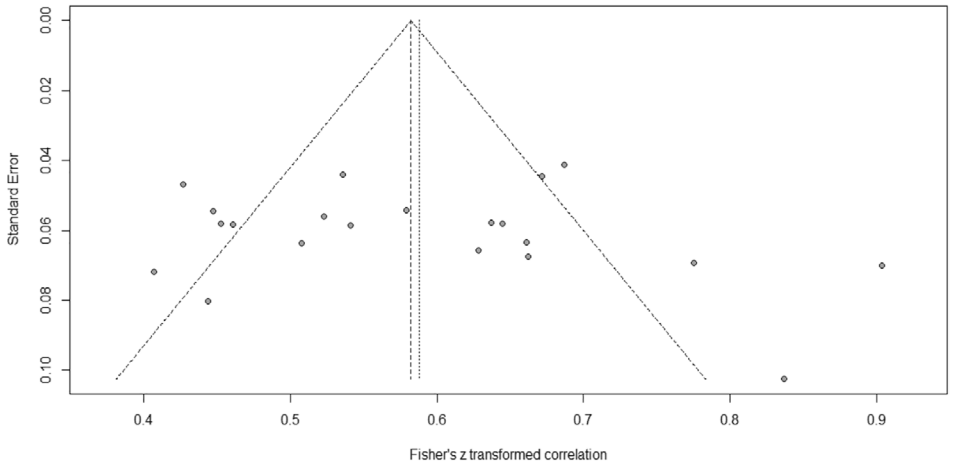



**FIGURE 4** | Funnel plot using Fisher's *Z*.

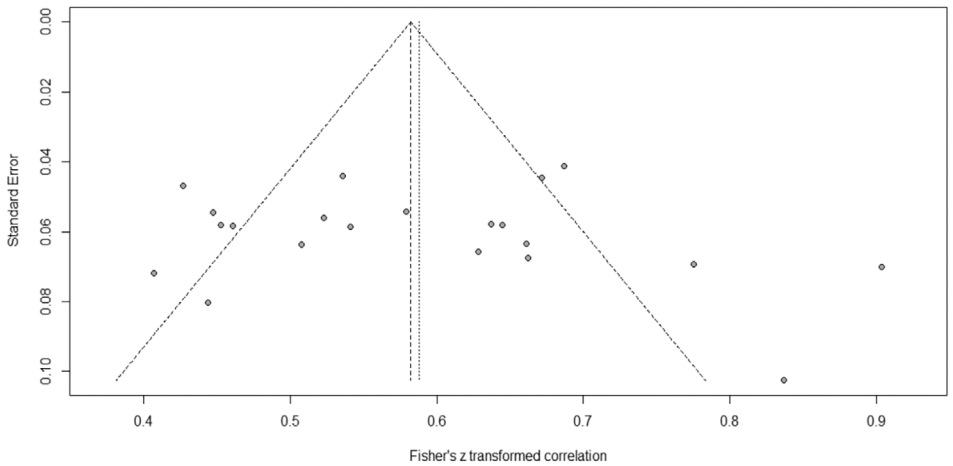



**FIGURE 5** | Trim-and-fill analysis using Fisher's *Z*.

ESG studies on corporate performance have reported that ESG environmental management reduces corporate risk (Singhania and Gupta 2024) and affects corporate financial performance positively (Albertini 2013). Our study is significant because we extend the discussion of existing research by examining the positive impact of ESG environmental management on consumer behavior through a meta-analysis, which no researchers have done before.

### 5.2 | Moderating Role of Publication Year, Gender, and Age

In this study we examined whether publication year, gender, and the proportion of 20–30-year-oldsmoderated the relationship between environmental practices and consumer purchase intention. As a result of examining the moderating effect of



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publication year, we found that the difference in effect size per publication year was insignificant.

This finding implies that the impact of ESG environmental practices on consumer behavior is not significantly different across time periods, which means that although ESG is increasingly emphasized in society through policies and public awareness, it has not translated into consumer behavior. This implies that ESG environmental management is now becoming a basic management activity that society recognizes, rather than a short-term trendy management activity. However, it may be due to the short period of the included studies from 2021 to 2024 as a possible reason for the lack of significant differences. Future researchers may be able to confirm these changes over a longer study period.

As for gender, a higher female rate was related to a higher purchase intention. This result indicates that female consumers have a higher sensitivity to corporate environmental practices, and therefore ESG environmental strategies can be more effective in driving changes in female purchasing behavior. Such findings underpin those of previous studies, including Potter et al. (2021) in which women were more influenced by eco-labels than men were, and Asad and Abid (2018) in which women were more loyal to companies with CSR-based business practices than men were. The reason why Korean women have stronger environmental behavioral intentions and attitudes than men is likely due to gender socialization (Workman et al. 2017). In other words, women are more active in protecting the environment because of the different ways in which men and women behave according to their socially assigned roles. For example, even in Japan, a culture similar to that of Korea, women engage more actively in private environmental activities through household activities such as recycling (Hunter et al. 2004). Based on these findings, it is likely that Korean women are more concerned about the environment because of their socially assigned roles than men are, which makes them more sensitive to ESG environmental management activities and leads to purchase intention.

We found that the proportion of 20–30-year-olds did not moderate the relationship between ESG environmental management and consumer purchase intention in 17 of the 21 studies for which information was presented. This indicates that the association between ESG environmental management and consumer purchase intentions is not stronger with younger consumers. These results are consistent with Puriwat and Tripopsakul (2023), who found that ESG initiatives have a positive impact on brand loyalty, but age does not moderate the relationship. A possible explanation for the lack of significant difference in effect size across age groups is that all generations generally recognize the importance of environmental issues, so the impact of ESG on purchase intention does not vary significantly across generations. In particular, because the practice of social responsibility management, such as environmental protection and improvement of corporate governance, has been emphasized in Korean society (Yoon et al. 2018), and ESG is currently applied in various fields, a social atmosphere has already been formed in which all generations consider environmental management essential. Therefore, it is possible that generational differences in values may not have been evident in this situation. It is also possible that the influence of ESG environmental management is small because many other factors determine purchasing decisions, such as price, quality, and brand recognition.

## 6 | Implications

### 6.1 | Theoretical Implications

This study has the following theoretical significance. We comprehensively and systematically investigated the impact of ESG environmental management practices on purchase intention in South Korea. Existing studies have mainly concentrated on the influence of ESG on shareholder- or investor-centered financial performance (Singhania and Gupta 2024; Velte 2017). In addition, some researchers in individual studies who have investigated the link between ESG and consumer behavior have reported mixed results, and few researchers have provided integrated evidence of impact of ESG environmental management on consumer behavior. To overcome these limitations, we synthesized individual studies and calculated the effect size of association between ESG environmental management and consumer purchase behavior. It is meaningful that this study expanded the scope of research by providing empirical evidence of the link between ESG environmental management and consumer behavior.

In addition, this study is significant because it confirms that the proportion of women moderates the effect of ESG environmental practices on purchase intentions. It implies that when the proportion of women is high, the impact of ESG environmental practices on purchase intentions is stronger. These results provide the evidence for heterogeneity and mixed results of previous studies. It is meaningful that the association between ESG environmental management and consumer behavior is explained more precisely by verifying the moderating effect of gender, which was hard to examine in previous individual studies.

Finally, the lack of a significant moderating effect of publication year suggests that the relationship between ESG environmental management and purchase intention remained consistent over the 4-year period of this study without significant fluctuations. This suggests that ESG environmental management has a stable impact on consumers. However, it would be interesting to see the trend in future studies with a larger sample of years.

### 6.2 | Practical Implications

Our results are useful as a basis for policy and corporate strategic decision-making because we examined how ESG environmental practices, emphasized across industries, influence consumer behavior. First, by confirming the importance of ESG environmental practices, we recommend that corporate strategies continuously consider the environmental aspect. Because consumers' perception of corporate environmental practices affects consumer behavior, it is necessary to expand ESG environmental management activities for corporate sustainability.

However, when conducting environmental activities, it is necessary to conduct genuine corporate environmental activities, not



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showy environmental practices. Because insincere and superficial activities such as greenwashing and ESG washing negatively affect consumers, it is necessary to share information with transparency and conduct genuine programs and activities.

Second, by demonstrating that ESG environmental practices have more influence on women than on men, the findings of this study can contribute to detailed strategies. When companies set and develop ESG-related strategies, it may be more effective to emphasize their environmental practices in relation to products and services targeted at female consumers.

## 7 | Limitations and Future Directions

Despite its significance, this study has the following limitations. First, we targeted South Korean consumers and searched and collected data only from Korean databases. Thus, it is unclear whether our findings are generalizable to other cultures and countries outside of South Korea, so further research could determine how results differ across different regions. In this sense, future researchers should include studies from international databases to examine the relationship between ESG environmental management and purchase intention in a more comprehensive way. Second, because we targeted only quantitative studies using survey methods, it is necessary to conduct a meta-analysis of qualitative studies in the future. Third, we were unable to obtain the average age of respondents in most studies, so we calculated effect sizes in terms of the proportion of 20–30-year-olds by taking the proportion of age groups. We also could not get information on the proportion of 20–30-year-olds in four studies, so we could not examine the moderating effect in all 21 studies. In future studies, it is necessary to investigate the moderating effect of age with more sophisticated information, such as the average age. Fourth, we were also unable to examine the moderating effect of industry type on ESG because of the mix of industry types within individual studies. Future researchers must explore the moderating effect of industry type. Fifth, because we looked at the tendency of the relationship between variables in the aggregate, it was not possible to identify the specific factors that caused these results. Further research is necessary to explore these issues, such as identifying the causes of gender differences.

## 8 | Conclusion

In this study we quantitatively synthesized relevant studies between ESG environmental practices and consumer purchase intention. The results showed that there is a positive relationship between ESG environmental practices and purchase intention, and the effect size was relatively large. This result highlights that a corporate ESG environmental practice has a positive and significant effect on consumer purchasing behavior. Moreover, we identified that ESG environmental practices tend to have a larger impact on female than on male purchase intention. However, the effect size between ESG environmental practices and consumer purchase intention did not differ significantly by year of publication or the proportion of 20-30-year-olds. Through meta-analysis, we provided the evidence of the impact of ESG environmental management and consumer purchase behavior and moderating effect of gender, which previous studies have been overlooked. It also showed that ESG environmental management is perceived as important without significant fluctuations. In this sense, we suggest that companies should more actively emphasize environmental dimensions when designing ESG strategies. In conclusion, because ESG environmental practices are essential for corporations attempting to achieve sustainability, it is important to implement sincere corporate environmental practices.

### Endnotes

[1] In this study we mainly focus on the proportion of 20–30-year-olds, but a few studies contain a small number of teenagers (e.g., S. J. Jang (2023) includes four teenagers).

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Studies with an asterisk(*) are those included in a meta-analysis

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