




Bridging the Intention–Practice Gap in Green Accounting Adoption: The Moderating Role of Environmental Ethics in Saudi Firms

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ABSTRACT: This study investigates the determinants of intention to adopt Green Accounting (GA) in Saudi firms to understand how intentions translate into actual GA practices as per the Theory of Planned Behavior (TPB). Moreover, the moderating role of Environmental Ethics (EE) is also tested in this relationship. Structural equation modeling is applied to data collected from 209 respondents by purposive sampling from accounting professionals, auditors, and finance managers. We find that attitude toward GA positively affects intention and actual practices of GA. Subjective norms, perceived behavioral control, perceived usefulness, and EE do not directly affect intention. However, intention positively predicts the practices of GA. In addition, EE has a positive direct effect on GA practices and also positively moderates the nexus between intention and actual GA practices. Thus, EE is found helpful in bridging the intention-practice gap. The model explains 61.8% of the variance in GA practices, which also demonstrates strong predictive relevance as per the results of Q². Based on findings, we suggest that Saudi firms foster positive managerial attitudes and strong environmental ethics, which could enhance GA practices, consequently, and could help in converting intentions into sustainability practices in the accounting system. Moreover, policymakers should embed ethical and environmental standards in corporate governance, which can help in bridging the intention-practice gap and support the Sustainable Development Goals.

Keywords: Green accounting adoption, Intention–practice gap, Environmental ethics, Theory of planned behavior (TPB), Sustainability and SDGs.

I. INTRODUCTION

Green Accounting (GA) has emerged as a practical tool to capture organizations' ethical, social, and environmental footprints in financial transactions. Rising global environmental problems and stakeholder inquiries push firms to adopt GA to develop sustainable business strategies [1]. Theoretically, GA may provide the tools to recognize environmental costs, which can help in managing ecological risks. However, practically, applying GA tools in daily organizational routines is fragmented and context-dependent. This gap is particularly more pronounced in emerging and developing economies. Regulatory authorities usually announce sustainability standards for GA. However, its application is mostly symbolic or partial in such

economies [2]. The firms in developing economies mostly take GA as a legitimacy concern instead of organizational intentions. Even firms expressing strong intentions to adopt GA do not always translate these intentions into consistent practices.

Saudi Vision 2030 is targeting sustainability, environmental protection, and responsible business behavior, which are strategic national priorities. In this regard, firms are encouraged to align financial performance with environmental concerns by adopting GA as a managerial and reporting practice, which can support decision-making, transparency, and long-term sustainability goals. However, GA adoption is usually constrained by limited awareness, technical capacity, and ethical commitment at the managerial level. The academic literature is trying to investigate factors to determine GA and disclosure. Some studies highlight the role of managerial attitudes, firm size, and profitability in shaping GA behaviors [1-3]. However, others also emphasize the role of legitimacy pressures in adopting GA. In this regard, firms mostly implement environmental disclosure to manage stakeholder perceptions instead of improving actual environmental performance. On the other hand, some studies also point out the internal organizational capacities and characteristics, which can influence GA behavior and adoption where formal institutions fail to enforce sustainability mandates. These studies are trying to understand the factors behind firms' engagement in GA. However, there is a need to understand the factors to determine the gap between intention and practice.

The intention and practice of GA are considered as closely aligned outcomes in the literature. However, behavioral research warned against this assumption. In this regard, the Theory of Planned Behavior (TPB) proposes that intention can be shaped by attitudes, Subjective Norms (SN), and Perceived Behavioral Control (PBC). Thus, intentions could not alone guarantee behavior. The TBC has been widely applied in sustainability and pro-environmental behavior research. However, its application to GA in Saudi firms is missing. Thus, the present study is trying to fill this gap by exploring the moderating role of Environmental Ethics (EE) in the nexus between intention to adopt GA and GA practices in Saudi firms. GA studies using TPB have focused solely on intention formation [1, 2], which ignored the translation of intention into action. Moreover, the study makes a theoretical contribution by extending TPB theory by integrating EE as a moral norm construct. In addition, the moderating role of EE is also tested in the INT-GAP nexus. Thus, the study contributes to the intention-practice gap literature [3], which assumes ethics serve as a bridging mechanism.

II. LITERATURE REVIEW

1. CONCEPTUAL FOUNDATIONS OF GA ADOPTION

GA is also termed as environmental accounting, Environmental Management Accounting (EMA), or Social and Environmental Accounting (SEA). It accounts for environmental degradation and climate risks, which are also a societal demand for corporate accountability [4, 5]. Its basic function is to emphasize technical function in measuring and reporting environmental costs [6, 7]. However, a later literature expands its scope by including ethical responsibility, stakeholder engagement, and sustainability governance [8-10]. Moreover, the modern literature considers GA as a socio-technical and ethical system, which can mediate relationships between firms, society, and the ecology [11, 12]. Furthermore, the literature suggested that education and digitalization can improve financial learning [13-17].

Empirical studies have demonstrated that GA helped in achieving tangible economic and strategic benefits. For instance, environmental disclosure in GA helped to improve market valuation, to reduce financial risk, to enhance earnings, and to improve strategic cost management in Jordan [18], in Vietnam [19], in Taiwan [20], in Turkey [21], and in India [22]. Moreover, EMA tools improved decision-making abilities, resource efficiency, and industrial relationships [23, 24]. Thus, EMA served as the operational tool. However, adoption of GA has remained fragmented in emerging and transitional economies due to different levels of institutional pressures, professionalism, and ethical commitments [25-29]. In the same context, the MENA literature has also corroborated that GA practices are limited and fragmented in the MENA region [30]. The GA literature mostly focuses on disclosure outcomes, regulatory pressures, ethical mechanisms, and firm-level characteristics [6, 30-32]. However, there is limited literature to explore the behavioral mechanisms [33,

34], which can translate managerial intention into actual GA practice. Considering the gap in Saudi literature, the present study is motivated to explore the behavioral aspects of the GA practices in Saudi firms. For this purpose, TPB is chosen for the theoretical foundation, which is more relevant to the present context compared to the Technology Acceptance Model (TAM). For instance, TAM focuses on the perceived ease and usefulness of technology. On the other hand, TPB incorporates social pressures and perceived behavioral control, which are more relevant in the Saudi context with varying regulatory enforcement [33]. TPB is also a better choice compared to Institutional Theory [35], which explains external legitimacy pressures. However, it does not account for individual managerial discretion and ethical mediation, which is a central focus of this present study. In addition, TPB is also superior to Upper Echelons Theory [36], which emphasizes the role of managerial characteristics. However, it lacks mechanisms for translating intention into action. Thus, TPB provides a parsimonious and comprehensive framework for studying the intention-practice gap by separately counting attitude, norm, control, and intention in the framework.

2. ATTITUDE TOWARD GA AND INTENTION TO ADOPT

GA attitude accounts for the favorable evaluation of engaging in GA practices. Theoretical behavioral literature has identified that attitude serves as a central predecessor of intention [33]. Particularly, in the GA literature, Chang et al. [34] found that accountants' attitudes toward organizational GA reform positively influenced acceptance of GA systems. Moreover, this study demonstrated that cognitive alignment between individual values and organizational culture positively impacted attitudes. However, the study failed to explicitly link attitudes to behavioral intention or actual implementation. Chen et al. [1] contributed to the GA literature by applying TPB in Sri Lanka and found that attitude significantly predicted managerial intention in adopting the GA. However, the authors did not examine the intention-practice gap. Moreover, some studies found that favorable attitudes toward environmental disclosure influenced limited practice in Malaysia [2] and in Bahrain [25], which provided limited evidence of the attitude-adoption relationship. Overall, the literature supports the relevance of attitude toward the adoption of GA. Thus, the following relationship is hypothesized in Saudi firms as GA awareness is rising in Saudi Arabia, as per Vision 2030:

- H1: Attitude toward GA positively influences intention to adopt GA.

3. SN AND SOCIAL PRESSURE

SN served as perceived social pressure from stakeholders, regulators, and society. Following legitimacy and stakeholder theories, empirical studies constantly showed that external pressure motivated GA adoption. For instance, Agyei and Yankey [37] worked on Ghanaian timber firms and found that government regulation, media, shareholders, and internal environmental committees improved GA and reporting. Moreover, the political economy framework showed legitimacy-seeking behavior. Thus, the focus of the firms remained on disclosure instead of internal practice. In the same way, Coetzee and Van Staden [38] investigated South African mining firms and found that legitimacy threats forced firms to adopt safety and environmental disclosures. Villiers and Van Staden [39] found that strategic modulation of disclosure was used to manage stakeholder perceptions. The same limitation was highlighted by Michelon et al. [3] by pronouncing it as camouflaging. Thus, these findings highlighted that SN usually resulted in symbolic compliance instead of practical adoption of GA.

On the other side of the relationship, the literature found that stakeholder pressure had less influence in comparison to internal managerial awareness and ethics in Vietnam [40] and in Albania [28]. This stream of literature highlighted that the effect of SN depends on institutional and cultural strength. Collectively, the literature signifies the influence of SN on intention to adopt GA. Thus, the study hypothesizes this relation in Saudi firms as follows:

- H2: SN positively influences intention to adopt GA.

4. PBC AND CAPABILITY CONSTRAINTS

PBC shows the perceived level of difficulty in the adoption of GA, which can be influenced by resources, skills, technology, and regulatory clarity. In this context, Chen et al. [1] investigated PBC aspects and found that PBC positively influenced intention to adopt GA, which was influenced by cost, complexity, and

regulatory pressures. However, the authors found that managers' practical constraints reduced actual GA practice. Moreover, Asiri et al. [29] investigated the MENA region and found that technological capability, environmentally oriented human resource practices, and institutional pressure had positive effects on the implementation of EMA. However, overall adoption of EMA was low. In another study, Badroos [41] found that Industry 4.0 technologies improved EMA adoption. However, financial constraints were barriers in the way of this adoption. In the context of SMEs, some studies identified that awareness of GA existed in employees and management, but a low level of information technology knowledge, skills, and resources reduced the effective adoption of GA in SMEs [42-44]. Overall, the literature signifies the importance of PBC in the intention of adopting the GA practices. Thus, the study hypothesizes this relationship in Saudi firms in the following way:

- H3: PBC positively influences intention to adopt GA.

5. *PU AND THE BUSINESS CASE FOR GA*

PU assumes the performance and strategic benefits of GA, which can influence the intention and adoption of GA with significant performance, strategic, and legitimacy benefits of GA. For instance, Alsakini [18] found the positive effect of environmental disclosure on firm value in Jordan. Similarly, La Soa et al. [19] and Li et al. [20] found that GA disclosure reduced financial risk, which helped improve earnings by reducing information asymmetry and by winning the confidence of investors in the long-term sustainability of the firms. In the strategic and operational aspects, GA might support efficient resource allocation, which can also reduce costs and improve climate risk management. Thus, GA can enable firms to understand environmental liabilities, which may align the GA system with long-term strategies [23, 45].

Some studies also reported the opposite findings. For instance, Castilla-Polo and Guerrero-Baena [46] found different perceptions between consultants and academics. Thus, GA is theoretically valuable. However, its practical benefits would not be immediately visible to managers. This case is more pronounced when reporting is largely due to compliance instead of strategic integration. Moreover, measurement problems of environmental costs and benefits, with a lack of standardized indicators and a low level of integration of GA with accounting systems, may reduce confidence in GA benefits outputs [47], which can also reduce the effect of PU on GA adoption. Thus, the effect of PU is conditional on organizational capabilities of GA literacy and data availability, along with GA tools. Moreover, the literature signifies that transparent GA frameworks aligned with managerial decisions increase the PU and adoption of GA [27, 28]. Overall, the literature provides evidence of the positive influence of PU on intention to adopt GA, and the following relationship is hypothesized for Saudi firms as follows:

- H4: PU positively influences intention to adopt GA.

6. *EE, INTENTION FORMATION, AND ACTUAL GA PRACTICES*

Ethical orientation is also a potential determinant of GA adoption. Some early literature mentions that GA requires accountants and managers to make moral judgments about ecological responsibility and accountability to society [6, 30]. Moreover, Boyce et al. [48] state that conventional accounting ignores environmental harm, which needs ethical reflexivity in GA practices. Furthermore, Apostolou et al. [49] found that ethics-focused training enhanced professional judgment and ethical sensitivity regarding commitment to sustainability objectives, which shaped behavioral intentions to adopt GA.

Other than intention, the literature also signifies the role of EE in promoting GA's actual practices. For instance, the literature found that managerial commitment, ethical leadership, and ethical orientation improved the adoption of GA through EMA control systems [50-52]. However, Weir [53] stated that ethical commitments were reduced with financial pressure, which was responsible for reduced GA adoption. The literature also explains the way by which EE can moderate the nexus between intention and actual adoption of GA. For instance, Perkiss and Tweedie [54] emphasize that ethical beliefs and value systems can improve behavioral change by motivating actors to move toward actual GA adoption instead of symbolic commitment. Similarly, Brown and Dillard [55] and Lehman [56] conceptualized ethics as a mediating force. Thus, ethics can reshape power relations, accountability mechanisms, and stakeholder engagement, which can translate intentions into actual practices. A recent study by Zherri and Kalemli [28] found that pro-

environmental values and ethical awareness motivated managers to operationalize sustainability commitments.

EE is included as a moral norm construct within an extended TPB framework instead of a value construct or institutional factor. Theoretical justification for this assumption is based on the norm activation model of Schwartz [57], which is also followed by sustainability research in TPB extension [58]. For instance, EE as a moral norm represents an individual's internalized sense of moral obligation to act in environmentally responsible ways, which is independent of external social pressures. Instead of personal values, moral norms are behavior-specific and can be activated by situational cues, which are GA adoption decisions in our case. Moreover, EE is different from institutional factors, as EE operates through internal moral reasoning. In addition, moral norms reflect self-accountability, which is different from subjective norms (perceived pressure from others). In our extended TPB model, EE serves as a direct predictor of GA practices (H6), which is a moral direct effect. Moreover, it is also a moderator of the intention-practice relationship (H7), which is a moral enactment mechanism. In addition, it may have a potential influence on intention (H5), which reflects a moral motivation pathway.

- H5: EE positively influences intention to adopt GA.
- H6: EE positively influences GA practices.
- H7: EE positively moderates the relationship between intention to adopt GA and GA practices.

7. FROM INTENTION TO PRACTICE

TPB explains that intentions are a powerful predictor of actual behavior. However, empirical studies on SEA show a persistent intention-practice gap. For instance, Chen et al. [1] focus on determinants of intention without investigating the way of translating intentions into actual GA practices. Some earlier literature also reports that awareness of environmental issues and positive managerial attitudes could not be translated into actual GA practices [21-23]. This result is highlighted more in the case of developing and emerging economies. Thus, it is not necessary that awareness and favorable intentions could guarantee actual GA practices. However, Giunta et al. [23] show that environmental accounting tools embedded in organizational routines and decision-making systems help achieve environmental improvements. Similarly, Chircop et al. [59] find that institutionalized GA frameworks and internal controls help to achieve the operationalization of sustainability intentions, which result in actual GA practices. On the whole, the literature signifies that intention is a necessary but not sufficient condition for GA adoption in developing countries. However, the study empirically tests the direct effect of intention on actual GA practices and hypothesizes the following relationship in Saudi firms:

- H8: Intention to adopt GA positively influences GA practices.

8. SYNTHESIS OF THE LITERATURE AND CONCEPTUAL FRAMEWORK

The prior studies have tested the direct effects of ATT, SN, PBC, Institutional pressure, PU, and regulatory pressure on GA adoption in South Asia [1], Southeast Asia [2], the MENA region [29], and Europe [47]. Table 1 displays the summary. None of these studies has examined the intention-practice gap in GA adoption. Moreover, Asiri et al. [29] considered ethics as an antecedent. Thus, prior work did not consider ethics as a moderator. The present study addresses this gap by empirically testing EE as a moderator in the nexus between intention to adopt GA and actual GA practices. In addition, the direct effect of EE on GA practices has also been investigated in the Saudi Arabian context.

Table 1. Synthesis of the literature.

| Region | Key studies | Main predictors supported | Intention-practice gap examined? | Role of ethics examined? |
|----------------|---------------------|---------------------------|----------------------------------|--------------------------|
| South Asia | Chen et al. [1] | ATT, SN, PBC | No | No |
| Southeast Asia | Zulkifli et al. [2] | ATT only | No | No |
| MENA | Asiri et al. [29] | Institutional pressure | No | Yes (as antecedent) |

| | | | | |
|--------------|--------------------|-------------------------|-----|--------------------|
| Europe | Petros et al. [47] | PU, regulatory pressure | No | No |
| Saudi Arabia | The present study | ATT, INT, EE, EE×INT | Yes | Yes (as moderator) |

Based on the 8 hypotheses developed in this section, Fig. 1 shows a complete conceptual framework of our proposed model. The study hypothesizes that attitude toward GA, SN, PBC, PU, and EE positively influence the intention to adopt GA, and the intention to adopt GA positively predicts GA practices. Thus, the intention to adopt GA is playing a mediating role in transmitting the effects of attitude toward GA, SN, PBC, PU, and EE toward GA practices. Moreover, EE directly enhances GA practices and is also expected to moderate the relationship between intention to adopt GA and actual GA practices.

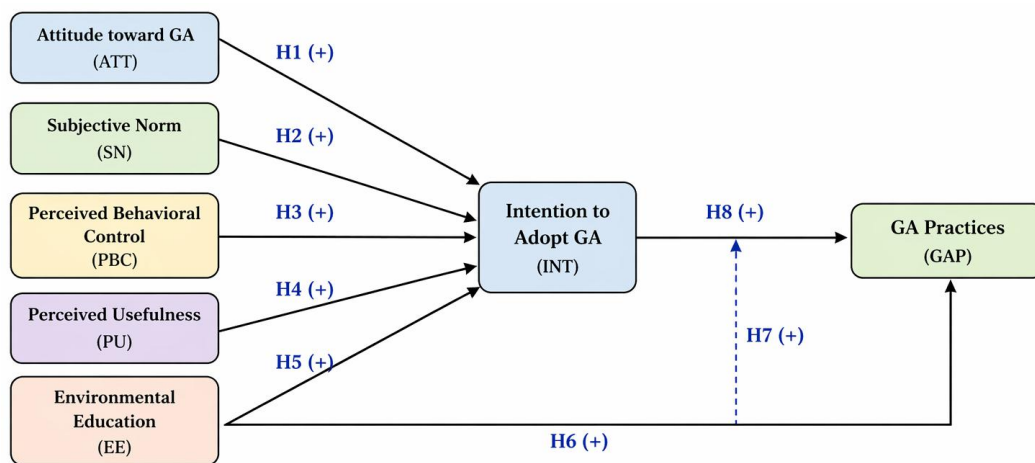


FIGURE 1. The proposed conceptual framework.

III. RESEARCH DESIGN AND METHODS

1. QUESTIONNAIRE AND DATA COLLECTION

A questionnaire is designed for the collection of data from a targeted population. At the first stage, the questionnaire includes 5 items for GA practices (GAP), which are taken from Zulkifli et al. [2] and Burritt & Lehman [6]. Intention to adopt GA (INT) contains 3 items, and Attitude toward GA (ATT) contains 4 items, which are taken from Chen et al. [1]. SN contains 4 items, and PBC contains 4 items, which are taken from Ajzen [33]. EE contains 4 items, which are taken from Ramautar [31] and Zherri & Kalemi [28]. PU contains 4 items, which are taken from Davis [60]. All items are translated into the Arabic language for the convenience of Saudi respondents. Five academic experts reviewed the items for clarity, relevance, and comprehensiveness for content validity. In the pretest stage, the questionnaire was tested with 10 accounting professionals to identify ambiguous wording and completion time, which led to minor corrections in all items. In the last stage, a pilot study was conducted with 20 respondents. The data was analyzed to assess reliability with Cronbach's α of more than 0.7 and factor loadings of more than 0.60. Then, the finalized questionnaire was distributed for final data collection.

GAP is defined as the extent to which a firm integrates environmental costs, liabilities, and performance indicators into its formal accounting system, which might support both internal decision-making and external reporting. Thus, GAP is entirely different from environmental disclosure, which might be symbolic (only external reporting). Moreover, EE captures three dimensions of environmental ethics. For instance, ethical principles are guiding environmental accounting. Second, ethical principles are also a moral obligation to stakeholders by reporting environmental impacts. Third, environmental responsibility is

embedded in a firm's long-term strategies. This measure is proposed by Ramautar [31] and also validated by Zherri & Kalemi [28] in the emerging economy context.

Given the specialized nature of the study, purposive sampling was adopted to ensure that respondents with relevant experience and knowledge would be selected, as random sampling would yield some ineligible respondents due to a lack of experience or awareness of GA practices that would reduce data quality. The target population consists of accounting professionals, auditors, and finance managers from Saudi firms, who are assumed to have sufficient knowledge of accounting procedures and awareness of GA practices. The information of respondents was collected from LinkedIn professional networks, SOCPA member directories, and professional accounting forums. The respondents were targeted with current employment in a Saudi firm and a minimum of 2 years of professional experience in financial or management accounting. The questionnaire was distributed to 320 respondents, and 209 eligible respondents completed the survey, which led to 65.3% of response rate. This sample size is sufficient for statistical analyses such as Structural Equation Modeling (SEM) as recommended by Hair et al. [61]. Each item of the construction was measured using Likert scales (1: strongly disagree) to (5: strongly agree). Following Podsakoff et al. [62], three procedural remedies were adopted to remove common method bias. First, all participants were assured of confidentiality and anonymity to reduce social desirability bias. Second, different scale anchors and reversed items were used. Third, predictor and criterion variables were separated in the questionnaire by placing INT and GAP items on different pages.

The study ignores the control variables in the model, such as industrial category, firm size, and age, as the study focuses on TPB, which focuses on individual-level psychological constructs and behavioral intention. However, firm size and industrial features are organizational-level factors, which are not theorized to directly influence the intention-practice gap in the context of GA adoption. Moreover, adding unnecessary variables may consume degrees of freedom and reduce statistical power for detecting the hypothesized moderation effects (H7). It can also increase model complexity without a theoretical benefit. Thus, we focus on psychological mechanisms and not structural factors. The literature on TPB also ignored such variables and focused on individual behavioral factors as the theoretical model is specified at the individual level [1,2]. Similarly, the study does not expect measurement invariance due to a lack of focus on categorical groups such as gender, age, education level, or organizational hierarchy during the data collection. Thus, the study does not hypothesize or compare differences across such groups.

2. STATISTICAL METHODS

SEM was applied using SmartPLS 3. At first, the measurement model was evaluated to ensure reliability and validity, which was tested through internal consistency using Cronbach's alpha and Composite Reliability (CR). Moreover, convergent validity was tested by using the Average Variance Extracted (AVE), and discriminant validity was tested by using the Heterotrait-Monotrait ratio (HTMT) and Fornell-Larcker Criterion. Moreover, multicollinearity was examined using the Variance Inflation Factor (VIF). Then, path coefficients are estimated, and model fit was evaluated using the Standardized Root Mean Square Residual (SRMR), the squared Euclidean distance (d_{ULS}), the geodesic distance (d_G), the Chi-square statistics, and the Normed Fit Index (NFI).

IV. RESULTS AND DISCUSSION

Table 2 presents the results of the confirmatory factor analysis. The outer loadings of all indicators exceed the threshold of 0.70, except PBC1 and EE2. It indicates satisfactory indicator reliability. EE2 (firm considers environmental costs in financial decisions) is removed due to low factor loading (0.48). Moreover, it has also conceptual redundancy with EE1 (environmental ethics guide our accounting practices), which captures a broader ethical orientation. However, the retained EE items (EE1, EE3, EE4) reflect the multidimensional nature of environmental ethics. PBC1 (Access to necessary resources for GA) is also removed due to low factor loading (0.57).

Moreover, it also has theoretical ambiguity as access to resources conflates organizational capacity with individual perceived control. However, the retained PBC items (PBC2, PBC3, PBC4) focus specifically on

skill adequacy, knowledge, and implementation difficulty, which are better aligned with Ajzen's [33] conceptualization of PBC. The remaining model is sound with construct reliability and validity. Internal consistency reliability is confirmed as Cronbach's alpha values range from 0.724 to 0.834. Moreover, CR values are between 0.845 and 0.898, which exceed 0.70. In addition, convergent validity is confirmed with AVE ranging 0.595-0.746, which are greater than 0.5. Thus, the constructions explain a substantial portion of the variance in their indicators. Furthermore, the VIFs of all indicators are below 3.3. Thus, it corroborates the absence of multicollinearity. Overall, the measurement model demonstrates adequate reliability, convergent validity, and collinearity. Thus, the study moves to structural model analysis.

Table 2. Confirmatory factor analysis.

| Latent Variables | Indicators | Outer Loading | Items deleted | Internal consistency reliability (α) | Internal consistency reliability (CR) | Convergent Validity (AVE) | VIF |
|------------------|------------|---------------|---------------|---|---------------------------------------|---------------------------|-------|
| ATT | ATT1 | 0.829 | | 0.773 | 0.854 | 0.595 | 1.857 |
| | ATT2 | 0.793 | | | | | 1.694 |
| | ATT3 | 0.715 | | | | | 1.474 |
| | ATT4 | 0.743 | | | | | 1.509 |
| EE | EE1 | 0.834 | EE2 | 0.829 | 0.898 | 0.746 | 1.681 |
| | EE3 | 0.879 | | | | | 2.105 |
| | EE4 | 0.878 | | | | | 2.080 |
| GAP | GAP1 | 0.771 | | 0.834 | 0.883 | 0.603 | 1.628 |
| | GAP2 | 0.816 | | | | | 2.514 |
| | GAP3 | 0.805 | | | | | 2.458 |
| | GAP4 | 0.705 | | | | | 1.414 |
| | GAP5 | 0.779 | | | | | 1.705 |
| INT | INT1 | 0.762 | | 0.724 | 0.845 | 0.645 | 1.371 |
| | INT2 | 0.792 | | | | | 1.407 |
| | INT3 | 0.852 | | | | | 1.633 |
| PBC | PBC2 | 0.765 | PCB1 | 0.741 | 0.853 | 0.660 | 1.318 |
| | PBC3 | 0.806 | | | | | 1.614 |
| | PBC4 | 0.863 | | | | | 1.805 |
| | | | | | | | |
| PU | PU1 | 0.706 | | 0.793 | 0.866 | 0.619 | 1.346 |
| | PU2 | 0.801 | | | | | 1.627 |
| | PU3 | 0.788 | | | | | 1.690 |
| | PU4 | 0.843 | | | | | 1.917 |
| SN | SN1 | 0.787 | | 0.826 | 0.885 | 0.657 | 1.599 |
| | SN2 | 0.838 | | | | | 1.989 |
| | SN3 | 0.812 | | | | | 1.804 |
| | SN4 | 0.805 | | | | | 1.787 |

Table 3 presents the results of the HTMT ratio. Overall results show a robust assessment of discriminant validity as per HTMT values below 0.90. Some construct pairs have HTMT near 0.9, such as Attitude-PU (HTMT = 0.895), Intention-PBC (HTMT = 0.875), and SN-PBC (HTMT = 0.891). Particularly, the HTMT value is high for the PU-ATT combination, which could have conceptual overlap, leading to multicollinearity. However, VIF ranges from 1.346 to 1.917 for both ATT and PU in Table 2. Thus, multicollinearity is not detected between these two constructs. In addition, HTMT is still lower than 0.9 [63]. Thus, HTMT remains within acceptable limits. Overall, the HTMT results confirm that the latent constructions are sufficiently distinct.

Table 3. HTMT ratio.

| Variables | ATT | EE | GAP | INT | PBC | PU | SN |
|-----------|-------|-------|-------|-------|-------|-------|----|
| ATT | | | | | | | |
| EE | 0.829 | | | | | | |
| GAP | 0.795 | 0.739 | | | | | |
| INT | 0.811 | 0.777 | 0.874 | | | | |
| PBC | 0.764 | 0.799 | 0.867 | 0.875 | | | |
| PU | 0.895 | 0.829 | 0.848 | 0.830 | 0.882 | | |
| SN | 0.846 | 0.765 | 0.746 | 0.819 | 0.891 | 0.779 | |

Fig. 2 shows the results of the structural model. ATT, SN, PBC, PU, and EE are modeled as predictors of INT. In comparison, ATT has the strongest direct effect on INT. Moreover, INT strongly predicts GAP. This result shows that increasing intention motivates a greater GA performance. Moreover, EE is also positively moderating the INT-GAP nexus. All observed variables (ATT1-ATT4, SN1-SN4, PBC2-PBC4, PU1-PU4, EE1-EE4, INT1-INT3, and GAP1-GAP5) show significant loadings on their respective latent constructs, which indicate a reliable measurement.

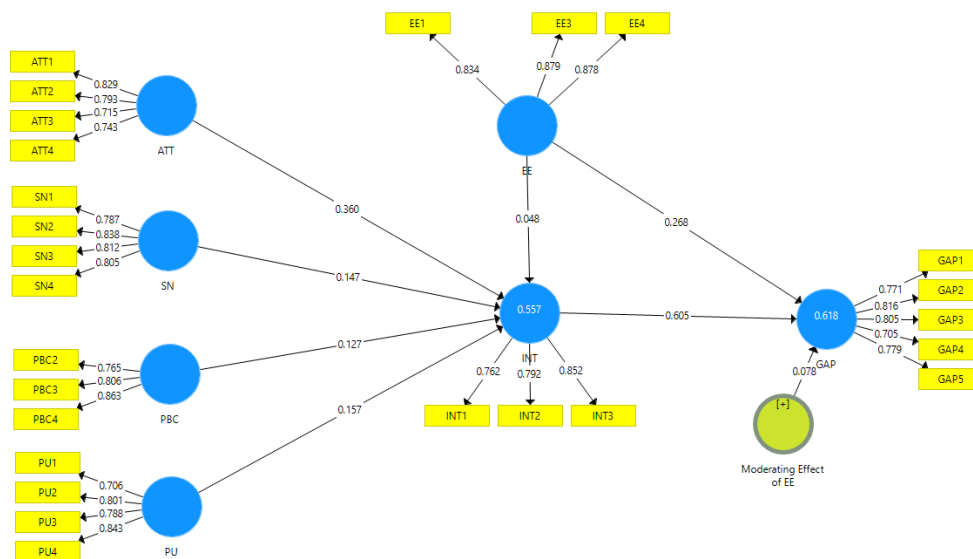


FIGURE 2. Measurement model.

In Table 4, ATT positively affects the INT with a coefficient of 0.37. This result supports the hypothesized relationship in H1. Thus, H1 is accepted, and a favorable attitude toward GA enhances the intention to adopt GA. However, SN, PU, EE, and PBC do not have statistically significant direct effects on INT. Accordingly, the results do not support hypotheses H2-H5. Although these dimensions have positive effects on INT, their effects are statistically insignificant. Thus, external social pressure and perceived ease of implementation are insufficient motivators in the Saudi firms. It shows that weak normative enforcement and insufficient institutional pressure could not improve intention to adopt GA practices. The insignificant effect of PU explains that anticipated performance does not automatically translate into adoption intention, which shows an ambiguity in the measurable outcomes of GA.

Moreover, ethical awareness is not operating at the motivational stage of decision-making. In the direct relationship between EE and GAP, EE shows a strong and positive effect on GAP, which supports H6. Thus, environmental ethics are a practical driver of implementation, and moral commitment helps transform

intention into action. Moreover, INT positively predicts GAP, which supports H8. This result highlights that intention is a necessary condition for the behavioral realization of GA practices. Most importantly, the moderating effect of EE on the intention-practice relationship is positive, which supports H7. This result suggests that environmental ethics work as an internal governance mechanism, which effectively improves the managerial intention to adopt GA and also converts intention into actual practice for GA adoption. Overall, the findings suggest that intention remains a central player in GA adoption and ethical commitment plays a bridging role, which materializes intentions into practical GA adoption in Saudi firms.

Table 4. Path coefficients.

| Path | Original Sample | Sample Mean | S.D. | t-statistic | p-values | Hypotheses |
|-------------------------------|-----------------|-------------|-------|-------------|----------|--------------|
| ATT → INT | 0.370 | 0.356 | 0.112 | 3.295 | 0.001 | H1: Accepted |
| SN → INT | 0.132 | 0.143 | 0.099 | 1.329 | 0.196 | H2: Rejected |
| PBC → INT | 0.135 | 0.136 | 0.095 | 1.414 | 0.167 | H3: Rejected |
| PU → INT | 0.152 | 0.157 | 0.094 | 1.618 | 0.106 | H4: Rejected |
| EE → INT | 0.048 | 0.049 | 0.088 | 0.545 | 0.589 | H5: Rejected |
| EE → GAP | 0.264 | 0.269 | 0.057 | 4.596 | 0.000 | H6: Accepted |
| Moderating Effect of EE → GAP | 0.078 | 0.078 | 0.045 | 1.734 | 0.095 | H7: Accepted |
| INT → GAP | 0.611 | 0.605 | 0.056 | 10.839 | 0.000 | H8: Accepted |

Fig. 3 shows the structural model path coefficients. At first, ATT positively influences INT ($p < 0.01$), which validates H1. However, SN, PBC, and PU could not influence INT ($p > 0.01$). Thus, H2, H3, and H4 are rejected. In addition, EE could not directly influence INT ($p > 0.01$), which leads to rejection of H5. However, EE is positively and directly influenced by GAP ($p > 0.01$), which validates H6. Moreover, EE is also positively moderating the INT-GAP nexus, which validates H7. Lastly, INT is positively and directly influenced by GAP ($p < 0.1$), which validates H8 at a 10% level of significance. Thus, INT is playing a mediating role to transmit the effect from ATT to GAP.

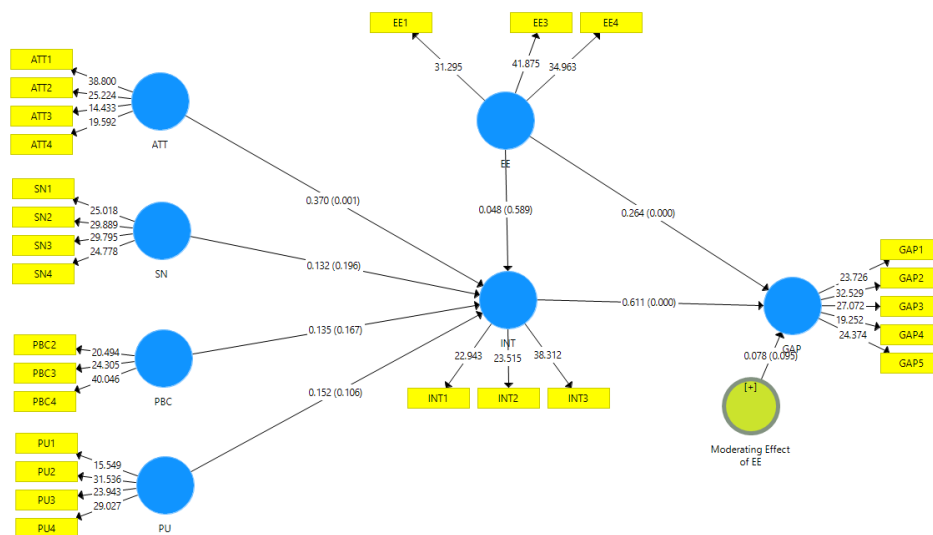


FIGURE 3. Structural model.

Table 5 reports effect sizes and predictive relevance. The threshold f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively [64]. The results show that ATT has a moderate effect on

INT. However, SN, PBC, and PU exhibit no meaningful practical effect on INT. INT shows a large effect on GAP. Thus, intention shows a central role in driving actual implementation. EE has a moderate direct effect on GAP. However, its interaction with intention (EE×INT) exerts a small moderating effect. Furthermore, the predictive relevance (Q2 values) confirms that the model has meaningful predictive power. For instance, INT demonstrates a medium predictive relevance, and GAP shows strong predictive relevance.

Table 5. Effect sizes and predictive relevance.

| Path / Construct | f ² | Effect sizes | Q ² (blindfolding) | Predictive relevance |
|------------------|----------------|----------------------|-------------------------------|----------------------|
| ATT → INT | 0.178 | Medium | | |
| SN → INT | 0.002 | no meaningful effect | | |
| PBC → INT | 0.009 | no meaningful effect | | |
| PU → INT | 0.011 | no meaningful effect | | |
| INT → GAP | 0.378 | Large | | |
| EE → GAP | 0.162 | Medium | | |
| EE×INT → GAP | 0.112 | Small | | |
| INT (endogenous) | | | 0.324 | Medium |
| GAP (endogenous) | | | 0.418 | Large |

Table 6 presents the coefficients of determination (R2) and adjusted R2. This result shows the explanatory power of the structural model for the endogenous constructs GAP and INT. In the GAP model, the R2 is 0.618. Thus, 61.8 % of the variance in GAP is explained by its predictors. Moreover, the adjusted R2 is 0.612, which corroborates that the model is well specified and not inflated by unnecessary predictors. Similarly, the R2 is 0.557, which shows that 55.7% variation in INT is explained by its predictors. Moreover, the adjusted R2 is 0.546, which corroborates the robustness and stability of the model. Overall, the results demonstrate that the proposed model has strong predictive capability in explaining GAP.

Table 6. R² and adjusted R²

| Dependent Variables | R Square | R Square Adjusted |
|---------------------|----------|-------------------|
| GAP | 0.618 | 0.612 |
| INT | 0.557 | 0.546 |

Table 7. Model fit summary

| Criteria | Saturated Model | Estimated Model |
|------------|-----------------|-----------------|
| SRMR | 0.076 | 0.079 |
| d_ ULS | 1.726 | 1.733 |
| d_ G | 0.623 | 0.629 |
| Chi-Square | 1074.725 | 1108.667 |
| NFI | 0.698 | 0.691 |

Table 7 reports the model fit indices for both the saturated and estimated models. The SRMR values are 0.076 and 0.079 for the saturated and estimated models, respectively, which are below 0.08. Thus, the model is well fitted. Moreover, d_ ULS values are 1.726 and 1.733 for the saturated and estimated models, respectively, which are relatively low. Furthermore, d_ G values are 0.623 and 0.629 for the saturated and estimated models, respectively, which are also relatively low. The Chi-squares are 1074.725 and 1108.667 for the saturated and estimated models, respectively, which are relatively low and reasonable as per the fitted models. The NFI values are 0.698 and 0.691 for the saturated and estimated models, respectively. NFIs are comparatively lower than the threshold. However, NFI is known to underestimate fit in smaller samples (N<250) and complex models [61], which is matched with our case of a sample size of 209. Moreover,

Henseler et al. [63] suggested prioritizing SRMR over NFI as NFI is not a distribution-free fit index. In addition, the estimated SRMR and d_G are within recommended thresholds (SRMR < 0.08; d_G < 0.95). Thus, the model fit results indicate that the estimated model is well-fitted to the data.

Table 8. Alternative model comparisons.

| Model | Paths included | AIC | BIC | R ² (GAP) | ΔR ² (compared to original model) |
|--------------------------|---|--------|--------|----------------------|--|
| Model 1 (Original) | All paths | 1242.1 | 1285.6 | 0.618 | |
| Model 2 (Parsimonious) | Only significant paths (ATT→INT, INT→GAP, EE→GAP, EE×INT→GAP) | 1250.4 | 1286.2 | 0.614 | -0.004 |
| Model 3 (Mediation only) | INT as mediator only | 1265.8 | 1318.4 | 0.542 | -0.076 |
| Model 4 (No moderation) | EE as a direct predictor only (no moderation) | 1260.3 | 1312.9 | 0.589 | -0.029 |

To validate the robustness of our findings, three alternative model specifications are estimated to compare the baseline estimated model, which are shown in Table 8. Model 1 is the original baseline model presented in Figure 3, which yielded the best fit with the lowest AIC and BIC values (AIC = 1242.1, BIC = 1285.6) in comparison with three other estimated models. Moreover, it also has the highest R2 value (0.618). Model 2 (Parsimonious) retains only statistically significant paths, which are mentioned in the table. This model shows a negligible drop in R2 value (0.614) and also slightly higher AIC and BIC values, which corroborate that the non-significant paths contribute little explanatory value and could not harm model fit. Model 3 (mediation only) considers intention solely as a mediator without the direct effect of EE on GAP. R2 value (0.542) has significantly dropped, and notably higher AIC and BIC values are also observed compared to the original model. Thus, both EE's direct and moderating effects are important for model specification. Lastly, Model 4 (no moderation) includes EE only as a direct predictor without the interaction term (moderation effect). R2 value (0.589) has significantly dropped with notably higher AIC and BIC values, compared to the original model. Thus, both EE's direct and moderating effects are important for model specification. Thus, both the direct effect of EE on GA practices and its moderating role in the INT-GAP nexus are meaningful contributors to explaining the intention-practice gap. Overall, the original model is the most fit.

V. DISCUSSION

As per the TBP theory of Ajzen [33], three core TPB drivers (ATT, SN, PBC) should significantly predict INT. However, the results of the study expose the partial validity of TPB theory. For instance, ATT predicts intention significantly, which is consistent with TPB theory. However, SN and PBC could not predict INT, which is a divergence from theoretical expectations in the Saudi context. It shows that a weak regulatory framework could not enforce firms to develop the behavior as per societal expectations. For instance, TPB assumes that regulators, competitors, and professional bodies should exert normative pressure on firms, but the Saudi GA landscape lacks sufficient authority or visibility. This finding is consistent with institutional theory's coercive isomorphism [35], which elaborates that normative mechanisms fail to operate with weak coercive pressure. The insignificant effect of PBC explains that GA adoption is not perceived as constrained by resources or skills but is aligned with volitional behavior boundary conditions of TPB [33].

The results show a significant relationship between ATT and INT, which supports the TBC of Ajzen [33]. Thus, attitude is found to be a powerful determinant of intention in Saudi firms. This result also follows earlier work on environmental and social accounting, which emphasizes the importance of personal and managerial beliefs in influencing sustainability-oriented decisions [33, 65]. In Saudi Arabia, GA is not fully mandated, but favorable attitudes act as a substitute for formal pressure from regulatory bodies. The insignificant effect of SN contradicts the literature, which emphasizes that attention is mostly geared up by

legitimacy pressures and stakeholder expectations [39, 66]. This result confirms that GA could not be reached at a level of institutional maturity in Saudi Arabia, which can enforce regulatory expectations. This result is in line with the findings of Zherri and Kalemi [28], who found that weak enforcement reduces the adoption. However, the adoption mechanism was positively affected by internal organizational factors in Albania.

The insignificant effect of PBC deviates from expectations of TPB. However, this result aligns with the literature, which suggests that adoption barriers are not technical but shaped by conceptual understanding and motivational factors [33, 67]. Saudi firms may already have achieved sufficient technical and financial capacity. Thus, perceived control may be less relevant at the intention stage. Moreover, the PU could not affect intentions. Thus, GA is not framed as a managerial tool in the Saudi context. This result agrees with the findings of Weir [53], who found that GA is justified through value creation narratives. However, its relevance can erode with a shift in economic priorities. However, the literature on both developed and developing economies confirms that improved decision-making and compliance are major drivers of intention [42, 47].

EE is a major construct in the model but has an insignificant direct effect on intention, which contradicts the literature on linking ethical orientation with pro-environmental decision-making [11,30]. However, this result is consistent with Momin [65], who finds that ethical awareness cannot develop clearly stated intentions in developing economies. However, EE shows a direct positive effect on actual GA practices, which is consistent with the findings of Ramautar [31] and Ramautar and España [32]. Thus, EE works as an action-oriented driver instead of a cognitive antecedent. Ethical commitment usually motivates organizations to adopt GA practices instead of just developing intentions. This finding contributes to recent debates that GA should not be just an intention-based explanation but should be enacted in practice [3]. The study findings also follow the argument of Vollmer [11], who suggests that GA should translate ethical concerns into practices.

The significant effect of intention on GA practices strongly validates the TPB of Ajzen [33] and the empirical results of Uddin et al. [68], who linked sustainability intentions with GA reporting. This result suggests that intention may become a powerful tool for organizational action for GA. Moreover, EE positively moderates the INT-GAP nexus, which indicates that ethics strengthen the intention-practice relationship and reduce the gap between them. This finding offers a novel contribution to the literature by corroborating that ethics do not act only as antecedents but also shape the action toward GA practices. This result contradicts the critiques of symbolic sustainability practices [3].

Overall results corroborate that TPB is a useful but incomplete framework to determine GA adoption. For instance, attitude and intention play their role in motivating the GA adoption in Saudi firms. However, normative pressure, control perceptions, and usefulness are not valid tools for Saudi firms. Moreover, integrating EE into the TPB framework may capture the moral and value-driven dimensions of GA in firms of the Saudi economy. Thus, firms should focus on managerial attitudes and ethical awareness aspects of GA instead of just focusing on regulatory pressure and technical guidance [69, 70].

In comparison to global literature, the present study finds a strong effect of ATT on INT in Saudi Arabia, which is aligned with the findings of Chen et al. [1] in Sri Lanka. Thus, favorable managerial attitudes may consistently improve GA intentions in developing economies. However, divergence is observed in the effect of SN and PBC. For instance, Chen et al. [1] found a significant effect of SN in Sri Lanka, which is not corroborated in the present study. However, our finding is consistent with the findings of Zherri and Kalemi [28] in Albania. Thus, weak institutional enforcement in developing economies is responsible for the low level of social norms and their effect on INT. The moderating role of EE is novel in our study. However, this result is consistent with arguments of Ramautar [31], who theorized that ethics is an enabling mechanism.

VI. CONCLUSION

This study examines the direct effect of ATT, SN, PBC, and PU on INT. Moreover, it is tested how INT translates into actual GA practices in Saudi firms by testing the moderating role of EE in the INT-GAP nexus. For this purpose, 209 valid responses were collected from accounting professionals, auditors, and finance

managers working in Saudi firms by using purposive sampling as per a very specialized type of survey. Using TPB, the study investigates the gap between intention and practice in GA. The TPB framework is partially supported with a significant direct effect of ATT on INT. However, direct effects of SN, PBC, and PU are insignificant. Thus, the findings inform that intention formation in Saudi firms is affected by internal evaluations and personal conviction instead of external social pressure, PBC, and perceived usefulness. The insignificant effects of SN, PBC, and PU indicate that weak normative enforcement, limited institutional pressure, and uncertainty regarding the tangible outcomes of GA reduce motivational power at the intention-formation stage. Thus, GA adoption is less influenced by compliance-driven factors. Instead, it depends more on decision-makers' personal valuation of GA. Moreover, INT strongly predicts actual GA practices, which corroborates that intentions are a necessary condition for behavioral realization to adopt actual GA practices. This result is in line with TPB assumptions, which advocate that intention is the primary conduit to develop favorable attitudes towards action to implement GAP. However, intention alone does not fully explain GAP, and EE positively moderates the INT-GAP nexus. This indicates that EE strengthens the possibility of converting managerial intentions into actual GA practices instead of considering them as symbolic.

1. POLICY IMPLICATIONS

The results of the study suggest several actionable policy recommendations:

- Attitude has the strongest direct effect on intention. Thus, policymakers should design frameworks to improve managers' favorable evaluation of GA. For instance, mandatory GA training modules in professional certification programs of SOCPA should be introduced. The government should provide tax incentives for firms, demonstrating a positive attitude through voluntary GA adoption. At the firm level, annual GA champion awards should be given to employees achieving the highest ATT scores.
- EE directly improves GA practices and also strengthens the intention-practice nexus. Thus, standardized and embedded ethical accounting standards should be introduced for the Saudi corporate sector. Moreover, firms should be required to publish an ethical accounting charter and ethics-based GA criteria in ESG disclosure.
- The insignificant effect of SN on INT reflects a weak governance structure. Thus, social pressures could not influence intentions. To improve the governance mechanism in Saudi Arabia, the government should develop an inter-ministerial task force to coordinate GA enforcement. Moreover, penalties should be introduced for non-compliance, which should be escalated with repeated violations.
- The insignificant effect of PU on INT shows that managers could not realize performance benefits. To improve the information about perceived benefits of GA, the government should fund to publish Saudi case studies, which could guide managers about waste reduction and energy savings benefits of adopting GA. It can improve the intention of managers to adopt GA practices. Moreover, the government should link GA adoption with government contracts by announcing a necessary condition of GA practices of firms to get government contracts.

2. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The study acknowledges its limitation of the cross-sectional design due to limited funds for this research, which prevents causal claims about intention-practice transformation. TPB suggests that intention precedes behavior. However, our data captures intention and self-reported practices, which may raise the possibility of reverse causality. Accordingly, our interpretation is cautious. For instance, interpretation of our findings should be taken as an association instead of causation between intention and practices. For instance, the moderation effect of EE should be treated as strengthening the concurrent intention-practice link instead of a causal transformation. To cover this limitation, future research should employ two-wave or three-wave longitudinal designs with time lags to establish causal direction. Moreover, due to the limited sample collected, the study could only test the mediation of INT in the ATT-GAP relationship. However, future research may extend the sample size to explore more mediation paths, which could have better policy relevance. We also acknowledge that we did not assess measurement invariance across all possible respondent characteristics, such as firm size, industry, and role, due to limited sample size and theoretically

lesser focus on these factors. However, future research should examine invariance across gender, education level, and professional certification status to conduct the measurement invariance analysis.

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Authors Contribution

Conceptualization, A.H.A.; methodology, A.H.A., H.M.; software, A.P.; validation, A.H.A., H.M., A.P.; formal analysis, A.H.A.; investigation, H.M., A.P.; resources, H.M.; data curation, A.P.; writing – original draft preparation, A.H.A.; writing – review and editing, H.M., A.P.; visualization, A.P.; supervision, A.H.A.; project administration, A.H.A., H.M.; funding acquisition, A.H.A., H.M., A.P.

Conflict of Interest

The authors have no potential conflicts of interest or such divergences linked to this research study.

Data Availability Statement

Data are available from the corresponding author upon request.

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