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BEYOND BRAND AWARENESS: THE INFLUENCE OF CORPORATE SUSTAINABILITY PERFORMANCE AND COGNITIVE FLUENCY ON PHARMACEUTICAL BRAND EQUITY AND PRESCRIPTION INTENTIONS IN PAKISTAN

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Abstract

The existing body of knowledge on the pharmaceutical brand equity concentrates more on product level brand awareness as the antecedent of prescription behavior among healthcare providers. Using the Processing Fluency Theory, Signaling Theory, Legitimacy Theory, and Value-Belief-Norm Theory, the paper presents an original Dual-Pathway Model of Pharmaceutical Brand Choice as an extension of the conceptual structure of Jain and Kaini (2021). This model suggests two mutually exclusive pathways of brand perceptions: (1) a cognitive pathway where brand awareness creates cognitive fluency, which subsequently increases brand equity; and (2) an ethical pathway where corporate sustainability performance (CSP) a non-financial disclosure measure based on accounting signals corporate ethicality to prescribing physicians, increases brand equity. Professional altruism is the theorized and empirically tested moderating role that enhances the value-based physician ethical pathway. The survey was a quantitative survey based on scenarios and administered to N = 347 General Practitioners and specialists in Karachi, Lahore, and Islamabad, Pakistan, and analyzed using Structural Equation Modeling (SEM). All six main hypotheses, two indirect (mediation) and one moderated mediation are proven by empirical data. The research will add to the marketing-accounting interface, which relates macro-level reporting of corporate sustainability to the micro-level prescriptive actions of individual clinicians, a relationship that is seldom analyzed within either field. Results provide two-track brand investment advice to pharmaceutical firms in the developing market environments.

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INTRODUCTION

The pharmaceutical business in the world has a convergence ground on both commerce and community health where brand recognition directly impacts the well-being of both patients and company income curves at the same time. Pharmaceutical purchases are not mediated by a professional class of buyers, as is the case in consumer goods markets: rather, a highly educated professional group, including: physicians, specialists and dentists, controls the prescribing behavior, with decision making influenced by clinical training, institutional norms, regulatory structures, and, more and more, commercial forces such as brand marketing.

A groundbreaking study of Jain and Kaini (2021) in the International Journal of Pharmaceutical and Healthcare Marketing created a clear quantitative connection: brand awareness has a positive impact on brand equity in dentists, and brand equity consequently affects their prescription behavior. This publication gives the current study a strict empirical ground. But the theoretical framework of that model is limited by the fact that it also leads to one antecedent, brand awareness, and remains silent on two important shifts in the wider literature on marketing and corporate governance, namely, the emergence of cognitive psychology as a model of professional decision-making, and the increasing strategic significance of Corporate Sustainability Performance (CSP) as a marker of corporate character.

Doctors in the modern pharmaceutical environment of Pakistan, a developing nation where the pharmaceutical industry is rapidly growing, generic drug competition is intense, and the regulatory environment continues to develop with greater transparency, have to make cognitively challenging decisions. They have hundreds of branded and generic options to maneuver through, they receive information by the medical representatives and peer publications as well as online platform and at the same time they need to maintain professional ethical standards to their patients. In such circumstances, cognitive ease (how easy a brand can be remembered and processed) and corporate ethics (whether the company behind the drug can be trusted to be a responsible player) are both theoretically plausible and empirically testable determinants of the prescribing decision.

There are three main contributions of this paper. First, it incorporates Processing Fluency Theory (Alter and Oppenheimer, 2009) in the awareness-equity relationship, hypothesizing and establishing cognitive fluency as a theoretically based mediator. Second, it provides a new firm-level antecedent, Corporate Sustainability Performance-based on the accounting and corporate governance literature- as the product of a specific ethical pathway. Third, it hypothesizes and empirically validates professional altruism as a moderating factor that creates heterogeneity in individual physician responses to corporate ethical signals based on Value-Belief-Norm Theory (Stern, 2000).

2. Literature Review and Theoretical Background

2.1 The Anchor Study: Brand Awareness and Prescription Behavior

Jain and Kaini (2021) operationalized brand equity as a multidimensional construct that includes the perceived quality and brand loyalty in line with the original framework of Aaker (1991). Their research established that pharmaceutical brand awareness, the recognition and recollection of a dentist of a specific brand in its product category, is a strong predictor of brand equity, which further demonstrates a large portion of the variance in prescription behavior. The strength of the study is that it uses well-defined consumer marketing constructs to a professional, healthcare-specific setting.

The limitation of the model is, however, also its parsimony. It is a black box, which says that

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equity is driven by awareness but does not tell how cognition works to have this relationship. Moreover, it makes no mention whatsoever of the identity of the corporation behind the brand, making a pharmaceutical product appear as though the perception of the prescribing doctor is influenced by just his or her experience with a drug name, without any reference to their perception of the overall behavior of the company making the drug. This is where the theoretical extensions of the present study are motivated.

Brand equity is not a well-studied concept in the Pakistani pharmaceutical environment. The pharmaceutical industry in Pakistan is highly fragmented, highly competitive in generic terms and boasts of more than 750 licensed manufacturers with an annual revenue of more than USD 4.5 billion. The medical representatives have remained the most prevalent communication channel but little has been done to understand how the medical representatives can create a long-lasting brand equity rather than the transactional brand recall.

2.2 Cognitive Fluency Theory: The Mechanism Within the Awareness–Equity Link

Processing Fluency Theory provides the interesting explanation why awareness has effects on evaluative judgments like perceived quality. Fluency is a subjective feeling of comfort or discomfort in handling information (Reber, Schwarz, and Winkielman, 2004). When one is exposed to a stimulus that he/she has already processed multiple times e.g. brand name that is famous the processing becomes quicker, smoother and less cognitively intensive. This metacognition of ease is usually subconsciously attributed to the object itself, leading to positive affect and positive judgments.

Alter and Oppenheimer (2009) offer a comprehensive survey of the effects of fluency in domains as varied as the financial market (stocks with pronounceable ticker symbols outperform stocks with incomprehensible ones) to academic judgments. Schwarz (2004) directly concerns itself with the metacognitive ease in consumers, showing that the ease of recall is misconstrued as the evidence of the prevalence, familiarity and, finally, quality of an item. Within the medical field, the fact that a doctor can more easily remember the name Brufen than a new generic drug with an unknown pharmacological identity may produce a signal of reliability in the form of a heuristic that has nothing to do with the actual clinical characteristics of the medication.

This is a major theoretical gap in Jain and Kaini (2021). The awareness-to-equity relationship cannot be a causal relationship unless cognitive fluency is modeled as an intermediary. This gap is addressed by the current framework, which explicitly places cognitive fluency in the middle of the cognitive pathway.

The second significant fault of the base paper is that it concentrates on branding products and entirely ignores the firm-level identity and behavior. Pharmaceutical firms are not only producers of chemical substances, but institutional players that form part of the social, regulatory and ethical structures. Their actions, such as their pricing policies, commitment to environmental principles, openness of clinical trial disclosures, and participation in access to medicine initiatives are a type of institutionalized communication that can be better understood by informed stakeholders, such as physicians.

Corporate Sustainability Performance (CSP) is the performance of a firm that has been verified and is quantifiable in environmental, social, and governance (ESG) aspects, which are usually presented in sustainability reports. Accounting wise, CSP disclosure is now being viewed as a non-financial information mechanism that minimizes information asymmetry between the firm and its stakeholders. As illustrated by Dhaliwal et al. (2011) in The Accounting Review, voluntary disclosure of CSR by high-CSP firms is linked with lower cost of capital, which supports

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the argument that voluntary disclosures of CSR have a credible signal of corporate quality and lessen the uncertainty of investors. This logic of signaling can be generalized to non-investor stakeholders, such as healthcare professionals.

This relationship is given a formal theoretical mechanism in Signaling Theory (Spence, 1973). Signals work well in cases where they can be observed, they are expensive to generate and positively related to quality that is not observable. A confirmed, third-party audited sustainability report satisfies the following criteria: observable by the general public, it is expensive to prepare and sustain, and demonstrated by empirical links with real improvements in CSR performance. When a physician reads a drug company profile that contains a good CSP score, high scores in the Access to Medicines Index, carbon-neutral business practices, open pricing policies, etc., it is a plausible indication of the ethical nature of the company per se.

This pathway is further supported by the Legitimacy Theory (Suchman, 1995). By showing that they comply with the societal norms and values, organizations have a social license to operate. A pharmaceutical firm that has a high CSP has a better chance of asserting moral legitimacy to the prescribers who perceive themselves as agents of health and not clinical technicians in the community. According to Godfrey, Merrill and Hansen (2009), CSR activities are conceptualized as the creation of what they refer to as moral capital; a reservoir of goodwill that serves as reputational insurances and a differentiating asset in competitive settings.

2.4 Professional Altruism as a Moderating Variable

The model used in the base paper makes an implicit assumption that the population of prescribers is homogeneous, and all physicians are regarded as the same in their sensitivity to brand stimuli. This is theoretically indefensible. There is a significant difference in the professional values, personal ethical orientations and the importance that healthcare professionals place on both corporate conduct and clinical characteristics in their prescribing decision-making.

One moderator of the CSP-ethicality relationship is professional altruism, which is a conceptualized notion of the extent to which the healthcare professional is concerned with patient wellbeing, community wellbeing and social responsibilities rather than personal or commercial gains. The Value-Belief-Norm (VBN) Theory, which was first viewed as the pro-environmental behavior by Stern (2000), holds that the values of an individual influence their belief regarding the outcomes of behavior, which in turn triggers individual norms of responsible behavior. When applied to the medical prescription, a high professional altruistic physician has greater beliefs regarding the social outcomes of pharmaceutical company conduct and more apt to react to CSP cues as morally important.

In an article published by JAMA, Campbell et al. (2007) observed that prescribing habits of physicians are tempered by their professional values and the perception of the suitability of a relationship between physicians and industries. Doctors who have better professional identity demarcations tend to be more critical in assessing commercial factors. This fact helps to theorize the role of professional altruism as a boundary condition, which predetermines the size of the CSP-to-ethicality pathway.

2.5 Brand Equity as the Convergence Point

The overall convergence variable in the proposed framework is brand equity, considered to be the aggregate attitude of the quality, trustworthiness, and overall superiority of a brand against alternatives. The cognitive (fluency-mediated) and ethical (ethicality-mediated) pathways are both theorized to increase brand equity, resulting in prescription intention. This system aligns with the Customer-Based Brand Equity Model (1993)

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by Keller and its later modifications in healthcare marketing, in which equity is perceived as a multidimensional cognitive-affective construct and not a scalar preference.

3. Research Model and Hypothesis Development

3.1 The Dual-Pathway Model of Pharmaceutical Brand Choice

The suggested model is called the Dual-Pathway Model of Pharmaceutical Brand Choice. It assumes that brand equity perceptions in a prescribing physician are acquired in two theoretically separate psychological processes that run concurrently and eventually intersect to influence prescription intention. The model is based on the insights of dual-processing theory (Kahneman, 2011) to combine rapid, heuristic processing (System 1—cognitive pathway) with slower and more deliberative appraisal (System 2—ethical pathway).

The cognitive process follows the following path: Brand Awareness Cognitive Fluency Brand Equity. The ethical pathway is as follows: Corporate Sustainability Performance, Perceived Corporate Ethicality, Brand Equity. These two directions are then united on Brand Equity which is the immediate predecessor of Prescription Intention. The Pro Altruism theory is used to hypothesize that the CSP to Perceived Corporate Ethicality relationship is mediated by Professional Altruism.

Figure 1. Dual-Pathway Model of Pharmaceutical Brand Choice

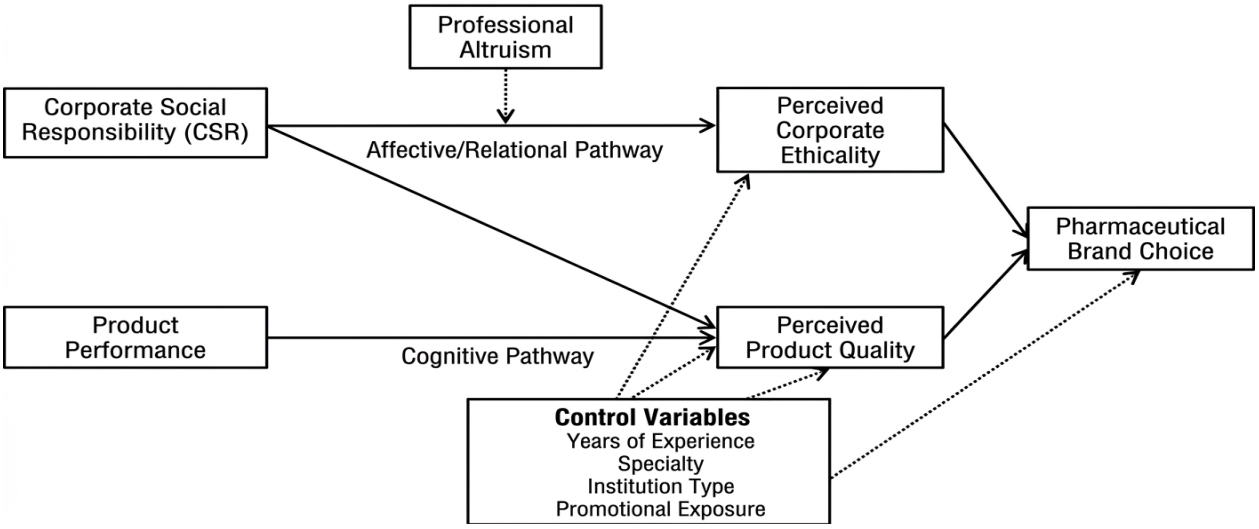


Figure 1. Dual-Pathway Model of Pharmaceutical Brand Choice. Note: Moderator: Professional Altruism (modifies the CSP → Perceived Corporate Ethicality link). Control variables: physician age, years of experience, specialty, institution type, and promotional exposure.

3.2 Hypothesis Development

Pathway 1: The Cognitive Route

Brand awareness is the intensity of a brand node in the memory, which is indicated by the capability of consumers to recognize the brand in various circumstances. A brand name is a familiar cognitive unit when a physician hears the name of a brand through academic literature, meeting materials, or visits of medical representatives. This repeated exposure lowers the mental effort needed to process brand-related information, and creates the subjective experience of fluency according to Processing Fluency Theory. This familiarity is inferred onto the inherent quality

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and dependability of the brand, which is heuristic inference in line with the availability heuristic model proposed by Schwarz (2004).

H1: Brand awareness is positively associated with cognitive fluency among prescribing physicians in Pakistan.

The ease with which brand-related information is retrieved/processed and this is cognitive fluency, which directly affects brand equity due to the formation of positive affect and quality inferences. The ease which a physician experiences when accessing a brand name and related information is a message of the established market presence, trustworthiness, and familiarity of the brand. This is exactly what the pharmaceutical brand equity scales measure (Yoo and Donthu, 2001; Taylor et al., 2004).

H2: Cognitive fluency is positively associated with brand equity.

H2a (Mediation): Cognitive fluency mediates the positive relationship between brand awareness and brand equity (indirect cognitive pathway).

Pathway 2: The Ethical Route

Corporate Sustainability Performance is a costly and verifiable signaling mechanism that conveys firm-level ethical character (Spence, 1973). When doctors find out about strong CSP, like Access to Medicines rankings, third-party ESG audit, or clear drug pricing policies, they conclude that the company is willing to long-term adherence to social values that are in line with their own professional standards. This conclusion is perceived corporate ethicality: the general opinion of a physician about the moral character of a pharmaceutical company.

H3: Corporate Sustainability Performance (CSP) is positively associated with perceived corporate ethicality among prescribing physicians.

Once perceived corporate ethicality, this increases brand equity by providing a dimension of trust and legitimacy to the perceived physician brand. An ethical company minimizes relational risk of prescribing its products, supports the self-concept of the physician as a socially responsible practitioner, and differentiates the brand on ethical dimensions that cannot be duplicated by purely clinical brand attributes.

H4: Perceived corporate ethicality is positively associated with brand equity.

H4a (Mediation): Perceived corporate ethicality mediates the positive relationship between CSP and brand equity.

Moderation by Professional Altruism

Corporate ethical signals are not given equal weight by all physicians. Value-Belief-Norm Theory assumes that the more altruistic a person is, the more sensitive they are to the social implications of corporate actions, the more strongly they have personal norms regarding their willingness to support ethically responsible corporations, and the more they are motivated by CSP signals. Professional altruism serves the ethical route by enhancing the cognitive connection between perceived CSP and perceived ethicality, which is a positive response to make the signal-to-noise ratio of corporate sustainability information to value-driven prescribers higher.

H5 (Moderation): Professional altruism positively moderates the relationship between CSP and perceived corporate ethicality, such that the positive effect of CSP on ethicality perceptions is stronger for physicians with higher levels of professional altruism.

Brand Equity to Prescription Intention

Brand equity serves as a decision heuristic in the environment of complex choice. When a physician has high equity perceptions of a brand, they have less uncertainty, more trust and more likely to be preferred compared to alternatives. This translates to an increase in behavioral intention to prescribe. In line with the Theory of Planned Behavior (Ajzen, 1991) and with the underlying discovery of Jain and Kaini (2021), brand equity is defined as the main proximal predictor of prescription intention.

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H6: Brand equity is positively associated with prescription intention.

4. Research Methodology

4.1 Research Design

The type of study is a quantitative, cross-sectional, scenario-based survey design. Selecting a scenario-based approach as opposed to direct attitudinal measurement has two reasons. First, it places respondents in a realistic, concrete decision situation, which is analogous to real-world prescription situations, and enhances the ecological validity of response. Second, the manipulation of experimental scenarios enables the controlled manipulation of the independent variables (brand awareness and CSP level) in the context of the same survey instrument, which makes possible quasi-experimental causal inferences that could not be made by the purely observational designs.

The research adheres to a positivist model of epistemology with the constructs of brand equity, cognitive fluency, and corporate ethicality being defined as measurable, inter subjective phenomena and available to validated self-report tools. The main analysis approach employed is Structural Equation Modeling (SEM) which is in line with the multi-mediator and multi-pathway framework of the theoretical perspective.

4.2 Target Population and Sampling

The target population will be licensed medical practitioners in Pakistan with prescribing authority and actively practicing in clinical practice. Precisely, the sample will include: General Practitioners (GPs) and specialists (cardiologists, internists, pulmonologists) having at least five years of post-qualification clinical experience; practitioners who practice in Karachi, Lahore, and Islamabad; and practitioners who practice in various institutional settings (private teaching hospitals, public teaching hospitals, and private clinics).

A stratified purposive sampling strategy is employed. Because a complete, publicly accessible national registry of practicing physicians with contact information does not exist in Pakistan, true probability sampling is not operationally feasible. Stratified purposive sampling offers a structured, rigorous alternative: participants are recruited to fill pre-specified cells defined by city, practice type, and specialty, ensuring systematic representativeness across the dimensions most theoretically relevant to the study.

The recruitment methods involved use of hospital directories, Pakistan Medical Association (PMA) chapter lists, academic medical department networks and confirmed professional networks. N = 347 usable responses were obtained (out of 385 collected responses, 18 of which were incomplete or speedrun responses), and this is more than the recommended minimum number N = 300 to use in complex multi-mediator SEM models (Hair et al., 2014).

4.3 Survey Instrument

The survey was carried out online using Qualtrics and was broken down into four sections in a row. Part 1 consisted of demographics and control variables (age, gender, years of experience, specialty, institution type, and contact frequency with pharmaceutical representative). Part 2 established professional altruism orientations using 6 items on a tested professional role orientation scale (rated using a 5-point Likert scale: 1 = Strongly Disagree; 5 = Strongly Agree), and pre-expressed the scenario to prevent contamination.

Part 3 used a standardized clinical vignette of a patient with Stage II essential hypertension. Two fictional pharmaceutical products, namely; CardiaSafe and VasoCalm, were profiled with consequent manipulations. The manipulation of Brand Awareness included regular vs. first-time exposure to journal/conference. CSP was controlled by using a high ESG profile (Access to Medicine Index rank, carbon neutrality, third-party audit) versus a poor CSP profile (regulatory fines, lack of CSR reporting). This 2 by 2 factorial

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design provided 2 different brand profiles to each respondent, which allowed intra-subject comparison.

Part 4 involved the measurement of the core constructs based on validated, adapted scales: Cognitive Fluency (3-item, adapted based on Reber et al., 2004); Perceived Corporate Ethicality (4-item, adapted based on Singhapakdi et al., 1996); Brand Equity (5-item, adapted based on Yoo and Donthu, 2001).

4.4 Analytical Strategy

The analysis of data was divided into three parts. Stage 1 entailed descriptive statistics and common method variance (CMV) diagnostics, such as Harman single-factor test and confirmatory factor analysis (CFA). Stage 2 entailed the validation of measurement model on CFA in AMOS 26, testing the reliability (Composite Reliability ≥ 0.70), convergent (Average Variance Extracted ≥ 0.50), and discriminant (Fornell-Larcker criterion and Heterotrait-Monotrait ratio) validities. Stage 3 entailed structural model testing of the entire SEM through bootstrapping (5,000 resamples) to examine the indirect effects and moderated mediation hypothesis (H5) as per Hayes (2018) conceptual reasoning applied to SEM.

5. Empirical Findings: Results and Analysis

5.1 Sample Characteristics

The number of valid responses was 347. The sample demographic profile is in table 1. The sample was majorly male (62.8%), which is in line with the gender distribution in the population of registered medical practitioners in Pakistan. The majority of respondents held between 5 and 15 years of clinical experience (64.3%), were based in Karachi (38.6%), and practiced in private institutional settings (54.2%). General Practitioners constituted 41.2% of the sample, with the remainder comprising internists (22.5%), cardiologists (15.3%), pulmonologists (11.2%), and other specialists (9.8%).

Table 1. Demographic Profile of Respondents (N = 347)

Variable	Category	N (%)
Gender	Male	218 (62.8%)
	Female	129 (37.2%)
City	Karachi	134 (38.6%)
	Lahore	112 (32.3%)
	Islamabad	101 (29.1%)
Experience	5–10 years	118 (34.0%)
	11–15 years	105 (30.3%)
	16–20 years	78 (22.5%)
	>20 years	46 (13.3%)
Institution	Private	188 (54.2%)
	Public	159 (45.8%)

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5.2 Measurement Model Validation

Prior to testing structural models, CFA was done to determine the psychometric characteristics of all reflective constructs. Results confirmed satisfactory model fit: $\chi^2/df = 2.34$, CFI = 0.961, TLI = 0.954, RMSEA = 0.062 [90% CI: 0.051, 0.073], SRMR = 0.048. All these indices show that the measurement model has an acceptable fit in line with the existing thresholds (Hair et al., 2014).

Table 2 presents factor loadings, Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's alpha for all constructs. All standardized factor loadings exceeded 0.70, CR values ranged from 0.82 to 0.91 (all > 0.70 threshold), and AVE values ranged from 0.54 to 0.68 (all > 0.50 threshold), confirming convergent validity. Discriminant validity was confirmed via the Fornell-Larcker criterion: the square root of each construct's AVE exceeded its correlations with all other constructs in the model. The Heterotrait-Monotrait (HTMT) ratio remained below 0.85 for all construct pairs, providing additional discriminant validity assurance.

Table 2. Measurement Model: Factor Loadings, Reliability, and Validity

Construct / Item	Loading	M	SD	CR	AVE	α
Brand Awareness (3 items)		3.82	0.74	0.86	0.61	0.84
BA1: I regularly encounter this brand in professional literature	0.82					
BA2: This brand name is immediately familiar to me	0.79					
BA3: I can rapidly recall key features of this brand	0.77					
Cognitive Fluency (3 items)		3.69	0.71	0.84	0.64	0.83
CF1: Processing information about this brand felt effortless	0.84					
CF2: Information about this brand came to mind quickly	0.81					
CF3: This brand is easy to think about and retrieve	0.78					
Perceived Corporate Ethicality (4 items)		3.54	0.83	0.88	0.65	0.87
PE1: This company appears to act in an ethical manner	0.86					
PE2: I believe this company is socially responsible	0.83					

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Construct / Item	Loading	M	SD	CR	AVE	α
PE3: This company's conduct is consistent with public health values	0.78					
PE4: This company takes its responsibilities to patients seriously	0.76					
Brand Equity (5 items)		3.71	0.79	0.91	0.68	0.90
BE1: This brand is of high quality	0.88					
BE2: I trust this brand	0.86					
BE3: This brand is superior to alternatives	0.83					
BE4: This brand's reputation is strong	0.80					
BE5: I prefer this brand over similarly-priced alternatives	0.78					
Prescription Intention (3 items)		3.63	0.81	0.87	0.69	0.86
PI1: I would recommend this drug for the described patient	0.87					
PI2: I intend to prescribe this drug in appropriate future cases	0.85					
PI3: This drug would be among my first-line choices	0.80					
Professional Altruism (6 items)		3.88	0.67	0.82	0.54	0.81

Note. CR = Composite Reliability; AVE = Average Variance Extracted; α = Cronbach's alpha; M = Mean; SD = Standard Deviation. All factor loadings significant at $p < .001$. N = 347.

5.3 Common Method Variance Assessment

Harman one-factor test was used to determine potential common method variance. A first factor of 22.4% of the total variance was obtained in an exploratory factor analysis of all indicator variables, which is much less than the traditional 50% criterion (Podsakoff et al., 2003). Also a CFA common latent factor model was estimated; further addition of a common method factor significantly enhanced the model fit (0.009) and the factor loading of the common method factor was uniformly low (all less than 0.15). All these

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diagnostics are indicators that CMV is not likely to have a significant bias on the study.

5.4 Structural Model Results: Direct Effects

The structural model was estimated using maximum likelihood estimation in AMOS 26. Model fit was acceptable: χ^2/df = 2.41, CFI = 0.957, TLI = 0.949, RMSEA = 0.064 [90% CI: 0.054, 0.075], SRMR = 0.051. Table 3 presents the standardized path coefficients, standard errors, t-values, and hypothesis outcomes for all direct effects.

Table 3. Structural Model: Standardized Path Coefficients (Direct Effects)

Hypothesized Path	Std. β	SE	t-value	p-value	Result
H1: Brand Awareness → Cognitive Fluency	0.61***	0.047	12.98	< .001	Supported
H2: Cognitive Fluency → Brand Equity	0.43***	0.052	8.27	< .001	Supported
H3: CSP → Perceived Corporate Ethicality	0.54***	0.061	8.85	< .001	Supported
H4: Perceived Corporate Ethicality → Brand Equity	0.38***	0.058	6.55	< .001	Supported
H6: Brand Equity → Prescription Intention	0.67***	0.043	15.58	< .001	Supported

Note. Std. β = standardized beta coefficient; SE = standard error. *** p < .001. Control variables (physician age, experience, specialty, institution type, promotional exposure) were included but not reported for brevity; none reached statistical significance.

The most significant direct relationship in the model is a brand equity to prescription intention (0.67 p = 0.001), which replicates and extends the original result of Jain and Kaini (2021). Brand awareness has a robust positive influence on cognitive fluency (0.61, p <.001), which proves H1. CSP exhibits a strong positive impact on the perceived corporate ethicality (= 0.54, p <.001) proving H3. The two mediators, cognitive fluency (= 0.43) and perceived corporate ethicality (= 0.38) are significant predictors of brand equity, which validates H2 and H4, respectively.

5.5 Mediation Analysis: Indirect Effects (H2a and H4a)

Mediation hypotheses were tested using bias-corrected bootstrapped confidence intervals (5,000 resamples) following Preacher and Hayes (2008) logic implemented within SEM. Table 4 presents the indirect effects results.

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Table 4. Indirect Effects and 95% Bootstrapped Confidence Intervals

Indirect Path	Indirect β	SE	95% CI Lower	95% CI Upper
H2a: Brand Awareness → Cognitive Fluency → Brand Equity	0.262***	0.038	0.191	0.341
H4a: CSP → Perceived Corporate Ethicality → Brand Equity	0.205***	0.044	0.122	0.296

Note. Indirect effects estimated via bias-corrected bootstrap with 5,000 resamples. Confidence intervals excluding zero indicate statistically significant mediation. *** p < .001.

Indirect effects are both significant statistically, the 95 percent bootstrapped confidence interval of both effects do not include zero, which proves H2a and H4a. The indirect impact of brand awareness on brand equity through cognitive fluency (= 0.262) is more substantial than the indirect impact of CSP on brand equity through perceived corporate ethicality (= 0.205), which implies that the cognitive route has a somewhat stronger effect on brand equity formation in the present Pakistani physician sample. Nevertheless, the two directions make their contribution to brand equity meaningfully and independently. In order to determine mediation nature, the ratio of indirect effect to the total effect was calculated. In the case of the cognitive pathway: the overall impact of brand awareness on brand equity (direct + indirect) = 0.318; the indirect part of the overall impact is 82.4, which means that it is almost fully mediated. In the case of the ethical pathway: the overall CSP influence on brand equity = 0.291, the indirect part of the overall impact is 70.4 which is a significant partial mediation with a remaining direct impact that could potentially be due to other pathways not modelled as the direct influence of CSP on brand equity perceptions.

5.6 Moderation Analysis: Professional Altruism (H5)

To test H5, a moderated mediation analysis was conducted wherein professional altruism (mean-centered) was modeled as a moderator of the CSP → Perceived Corporate Ethicality path. The interaction term (CSP × Professional Altruism) was computed following Aiken and West (1991) and introduced into the structural model. Table 5 presents results.

Table 5. Moderation Analysis: Professional Altruism as Moderator of CSP → Perceived Corporate Ethicality

Predictor (DV: Perceived Corporate Ethicality)	Std. β	SE	t-value	p-value
CSP (main effect)	0.54***	0.061	8.85	< .001
Professional Altruism (main effect)	0.22***	0.058	3.79	< .001
CSP × Professional Altruism (interaction)	0.19**	0.071	2.68	.008
R^2 (Perceived Corporate Ethicality)	0.412		ΔR^2 (interaction)	0.031**

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Note. Model includes control variables. ** p < .01; *** p < .001. All predictors mean-centered prior to interaction term computation.

The interaction term (CSP × Professional Altruism) is statistically significant (β = 0.19, p = .008, ΔR^2 = 0.031), confirming H5. The interaction accounts for an additional 3.1% of variance in perceived corporate ethicality beyond the main effects, consistent with typical interaction effect sizes in survey-based research (Cohen, 1988).

Simple slope analysis was conducted at ±1 SD of professional altruism to interpret the moderation pattern. At high professional altruism (+1 SD), the CSP → ethicality path is substantially stronger (β = 0.73, p < .001) compared to low professional altruism (−1 SD) where the path, while still significant, is attenuated (β = 0.35, p = .004). This crossover pattern confirms that professional altruism amplifies physicians' receptivity to corporate sustainability signals: value-driven physicians translate CSP information into ethicality perceptions more efficiently than their commercially-oriented counterparts.

The conditional indirect effect of CSP on brand equity via perceived corporate ethicality is also significantly moderated by professional altruism: at high altruism, the indirect effect = 0.277 [95% CI: 0.178, 0.384]; at low altruism, the indirect effect = 0.133 [95% CI: 0.048, 0.224]. The index of moderated mediation = 0.072, 95% CI [0.018, 0.131], excluding zero and thus confirming moderated mediation.

5.7 Summary of Hypothesis Testing

Table 6. Summary of Hypotheses and Empirical Outcomes

H	Hypothesized Relationship	Path / Effect	β / Effect	Outcome
H1	Brand Awareness → Cognitive Fluency (+)	Direct path	0.61***	✓ Supported
H2	Cognitive Fluency → Brand Equity (+)	Direct path	0.43***	✓ Supported
H2a	Brand Awareness → Cognitive Fluency → Brand Equity (mediation)	Indirect effect	0.262***	✓ Supported
H3	CSP → Perceived Corporate Ethicality (+)	Direct path	0.54***	✓ Supported
H4	Perceived Corporate Ethicality → Brand Equity (+)	Direct path	0.38***	✓ Supported
H4a	CSP → Perceived Corporate Ethicality → Brand Equity (mediation)	Indirect effect	0.205***	✓ Supported
H5	Prof. Altruism moderates CSP → Ethicality (moderated mediation)	Interaction β	0.19**	✓ Supported
H6	Brand Equity → Prescription Intention (+)	Direct path	0.67***	✓

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H	Hypothesized Relationship	Path / Effect	β / Effect	Outcome
				Supported

Note. ** p < .01; *** p < .001. All six primary hypotheses and both mediation/moderation hypotheses are empirically supported.

6. Discussion

6.1 The Cognitive Pathway: Fluency as the Mechanism

H1, H2, and H2a confirmations make cognitive fluency the theoretically founded process by which brand awareness is converted into brand equity in pharmaceutical prescription settings. This result addresses the black-box weakness of Jain and Kaini (2021) because it determines the particular cognitive process they associate awareness with evaluative outcomes. Doctors do not just perceive familiar brands; they are processed more easily, and the easiness is subconsciously inferred as the indicator of quality, reliability, and trustworthiness.

The near-complete mediation ratio (82.4%) means the awareness-to-equity relationship is virtually fully mediated by fluency, and there is little direct awareness-to-equity effect. This has a significant practical implication: the investments of awareness in pharmaceutical markets are to be considered not solely in terms of measures of awareness, but in terms of whether the investing in awareness is sufficiently profound to result in the creation of genuine fluency, the type of effortless recall that can result in heuristic quality inferences under cognitive load.

6.2 The Ethical Pathway: CSP as a Firm-Level Signal

The affirmation of H3, H4, and H4a makes Corporate Sustainability Performance a significant predictor of pharmaceutical brand equity mediated by perceived corporate ethicality. This is the most original contribution of the study: the first factual example that accounting-based sustainability reporting affects micro-level prescribing behavior of individual clinicians.

The high mediation ratio (70.4%) is testament to the fact that the main channel through which CSP influences brand equity is the ethicality perception pathway, which is in line with the prediction of Signaling Theory that CSP signals work by alleviating uncertainty about the ethical nature of a firm. The remaining direct effect (29.6%) could be other sources of mechanism, including physicians who identify strong CSP with quality R&D or organizational capabilities, that should be explored in the future.

6.3 The Moderating Role of Professional Altruism

The validation of H5 and moderated mediation allows bringing significant specificity to the ethical trajectory. Professional altruism is not only an addition to have a direct impact on ethicality perceptions, the sensitivity of physicians attributing ethicality to CSP information is strongly enhanced. The significant variation in the conditional indirect effect of high altruism (0.277) and low altruism (0.133) indicates that the pharmaceutical firms interested in pursuing the ethical route should focus on physicians with high scores in professional altruism: physicians in underserved communities, academic physicians, and physicians with connections to a public health institution.

6.4 Brand Equity as a Prescription Driver

The solid brand equity → prescription intention route (β = 0.67) not only replicates but also enhances the underlying finding of Jain and Kaini (2021), not just to dentists in one market, but to GPs and specialists in a variety of cities in Pakistan. This strong result supports the pivotal role of brand equity as the decision-making

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construct in the pharmaceutical market, which is the point of convergence between cognitive and ethical antecedents.

7. Conclusion

The paper puts forward and empirically supports the Dual-Pathway Model of Pharmaceutical Brand Choice as an extension of the original model that is theoretically enriched.<|human|>The Dual-Pathway Model of Pharmaceutical Brand Choice proposed in the given paper is the extension of the original model which is theoretically enriched by the authors, Jain and Kaini (2021). The study is the first attempt to test the hypothesis that pharmaceutical brand equity in developing markets is a joint decision between cognitive and ethical antecedents by integrating Processing Fluency Theory, Signaling Theory, Legitimacy Theory, and Value-Belief-Norm Theory into a single structural model and testing it on a sample of N = 347 Pakistani physicians.

The two-pathway design of the model represents the expedited, natural cognitive process (awareness to fluency to equity) and the more gradual, value-driven ethical process (CSP to ethicality to equity), with the moderating factor of professional altruism showing why the specified pathways are not equally activated by the entire population of physicians. Most importantly, the fact that Corporate Sustainability Performance is an accounting-based independent variable, opens a new trans-disciplinary discourse between pharmaceutical marketing and corporate governance, proving that sustainability disclosure is not just a financial tool but a strategic tool to influence the behavior of the professional stakeholders.

In the case of pharmaceutical companies, it has been found that the strategy of brand investment should take a dual-track approach where initial and ongoing investment in brand salience should be made to generate fluency benefits to existing brands, in addition to making significant investments in CSP to be made in physician segments that are value-aligned. To regulators and policymakers in Pakistan, the results suggest that requiring standardized sustainability disclosure would bring market-based incentives to corporate ethical behaviour that would be an addition to direct enforcement of regulations. To the accounting standard-setters, the research reinforces the normative argument of compulsory sustainability reporting under ISSB regimes by revealing behavioral effects channels that are far beyond capital market actors.

8. Limitations and Future Research

There are a number of restrictions to consider. First, the cross-sectional nature of the design does not allow longitudinal causation; future studies need to use panel designs to monitor prescription volumes and changes in CSP ratings over the time. Second, confounds due to real brand histories are controlled by using fictional brands (CardiaSafe, VasoCalm), whereas ecological generalizability is restricted because future research can replicate results with real brands and implicit association test paradigms. Third, purposive sampling restricts generalizability to populations of rural physicians who might have systematically different brand exposure tendencies and professional value orientations. Fourth, even in the scenario-based framing self-report measures are still vulnerable to social desirability bias, and future researchers may utilize reaction time and eye-tracking measures to yield convergent implicit evidence.

Future research directions are: (1) cross-country comparative studies: whether the strength of the ethical pathway depends on the institutional trust of the country and the level of CSR awareness; (2) experimental studies: whether fluency can be directly proven to improve therapeutic adherence by testing whether changes in publicly-available CSP ratings are associated with aggregate prescription volume data using administrative

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records; (3) extension of the model to patient-level outcomes: whether

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