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Warmth and Competence: An Empirical Investigation of the Dual Impact of Corporate Apologies on Repairing Brand Trust

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Abstract

Brand crises frequently lead to the erosion of consumer trust, with corporate apologies serving as a widely utilised strategy for trust repair. While existing research supports the effectiveness of apologies in repairing brand trust, limited attention has been given to the underlying psychological mechanisms from the consumer perspective. Drawing on the Stereotype Content Model (SCM), a dual-path trust repair mechanism was proposed to systematically examine how corporate apologies influence brand trust repair through perceived warmth and perceived competence. Unlike previous studies, the SCM framework was employed to provide a more comprehensive explanation, demonstrating how corporate apologies in brand crisis contexts impact trust recovery via both emotional (perceived warmth) and cognitive (perceived competence) dimensions. Utilising structural equation modelling (SEM) to analyse questionnaire data from consumers of new energy vehicles (n=412), the findings indicate that corporate apologies not only directly enhance brand trust but also indirectly facilitate trust repair by increasing perceived warmth and perceived competence, which function as mediating variables in the repair process. These insights extend the theoretical framework of brand crisis management and trust repair research while offering empirical support for optimising corporate apology strategies.

Keywords: Brand Crisis; Stereotype Content Model; Apology; Perceived Warmth; Perceived Competence; Brand Trust.

1. Introduction

Brand crises have become increasingly prevalent in recent years, with surveys indicating that nearly 75% of brands experience at least one crisis exposure annually, and over half of these brands face multiple crises within the same period [1]. Brand crises not only undermine consumers' trust in brands but also may lead to long-term damage in the consumer-brand relationship [2-4]. Brand trust represents a critical intangible asset for firms, playing a fundamental role in facilitating consumer decision-making in uncertain environments [5] and significantly influencing brand loyalty, brand equity accumulation, and overall market performance [6, 7]. As such, the repair of consumer trust following a brand crisis has emerged as a key area of concern for both academic researchers and corporate managers. Effective crisis communication strategies enable companies to secure consumer forgiveness and repair brand trust [8]. Among these

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strategies, corporate apologies represent one of the most widely utilised and empirically supported trust repair mechanisms in brand crisis management [9-12]. Research indicates that corporate apologies can reshape the consumer-brand relationship by enhancing consumer satisfaction and mitigating the negative impact of trust violations [11, 13]. For instance, Tesla faced a large-scale vehicle recall in China due to product quality issues [14], which significantly eroded consumer trust. However, by implementing a strategically designed apology combined with remedial actions such as transparent information disclosure, Tesla was able to partially repair consumer trust. This case underscores the notion that the effectiveness of a trust repair strategy depends on its ability to enhance consumer perceptions of brand reliability, which ultimately determines the success of trust repair [15].

At present, research on the repair of brand trust by apologies at the level of the firm-consumer relationship focuses on the three aspects of affective repair, functional repair, and informational repair [16-18] and suggests that apologies can repair trust through specific measures such as expressing remorse, taking responsibility, and providing compensation [19, 20]. Existing research has extensively examined the role of consumer perceptual factors in the trust repair process, primarily focusing on the cognitive and evaluative dimensions of apology strategies. Studies have demonstrated that various consumer perceptions, such as time sensitivity [12], perceptions of violation severity [21], and perceptions of social mindfulness [22], significantly influence the effectiveness of trust repair. Further, perceptions of justice [23] and perceived sincerity [24, 25] have been identified as critical determinants in re-establishing consumer trust following a brand crisis. Nonetheless, while existing studies have explored the impact of various perceptual factors on trust repair, most have examined these variables in isolation, lacking a comprehensive theoretical framework to systematically explain the psychological mechanisms underlying consumer trust repair. In addition, several studies have explored the effects of apologies on consumers' affective responses [18, 26] and competence perceptions [27, 28], separately; however, few studies have examined how apologies simultaneously activate both affective and competence perceptions and how these two factors interact to facilitate the repair of brand trust. This gap highlights the need for an integrated approach that considers the dual influence of emotion and cognition in the trust repair process. Therefore, drawing on the Stereotype Content Model (SCM), in the present study, a systematic investigation was conducted into how corporate apologies influence brand trust repair through consumers' perceptions of warmth and competence, emphasising the role of psychological perceptions in the trust repair process. According to SCM theory, individuals evaluate people, groups, and entities based on two fundamental dimensions: warmth, which reflects perceptions of a brand's goodwill and sincerity, and competence, which represents the brand's professionalism and problem-solving ability. These dimensions shape consumer attitudes and behavioural tendencies, ultimately determining whether they trust or distrust the brand [29, 30]. Subsequently, a dual-path trust repair mechanism was proposed: perceived warmth enhances trust through the affective pathway, while perceived competence facilitates trust repair through the rational pathway. Compared to a single perceived influence factor that focuses only on apology, a more comprehensive theoretical framework based on SCM was established, which can provide a more robust explanation of the consumer trust repair mechanism following a brand crisis.

To test the proposed research hypotheses, a quantitative research method was employed by collecting data from new energy vehicle consumers in the three major markets of Shanghai, Shenzhen, and Beijing through a questionnaire survey. The data was analysed using Structural Equation Modelling (SEM) to examine the relationships between corporate apology, perceived warmth, perceived competence, and brand trust. The results indicate that corporate apologies not only directly repair brand trust but also indirectly enhance trust repair by increasing consumers' perceived warmth and perceived competence, confirming the mediating role of these two variables. These findings contribute to the theoretical advancement of brand trust repair and offer empirical support for companies in optimising their apology strategies to improve consumer trust repair.

The structure of the present study is arranged as follows: First, a review is provided of the Stereotype Content Model and its role in brand trust repair, along with the current state of research on each core variable. Second, a description is given of the research methodology, including variable measurement, sample selection, and data analysis techniques. Third, an analysis is provided of the empirical results, as well as the tested research hypotheses. Fourth, a discussion is presented on the study's findings, followed by relevant conclusions. Fifth, a summary is provided of the theoretical contributions and managerial implications of the study. Finally, the study's limitations are outlined, and directions for future research are proposed.

2. Literature Review and Hypotheses Development

2.1. Apology

An apology is a primary means by which an offender explains misconduct across diverse cultures, willingly acknowledging their wrongdoing and expressing remorse and empathy toward the victim, sometimes accompanied by a promise of restitution [31, 32]. This form of response, referred to as a full apology [33, 34], represents a repair

behaviour that not only conveys regret but also actively assumes responsibility, serving as an essential prerequisite for forgiveness [35]. An apology is not merely a single expression of regret; instead, a multi-component apology is more effective than one composed of a single element [12, 36]. Scholars from various nations have reached a consensus on the three crucial components of an apology—expressing empathy, acknowledging the violated norms, and offering restitution [19]. From the perspectives of socio-emotion and personal cognition, when a crisis occurs, it is crucial for corporations to express regret and demonstrate sympathy by conveying warmth and empathy towards the victims. Some scholars argue that such actions, grounded in management theory, can effectively mitigate conflicts and contribute to resolving the crisis [37]. Acknowledgement of violated norms is a critical component of an apology, as it extends the scope of the apology to a broader audience. Behavioural norms, which are pervasive in both organisational and interpersonal contexts, are widely recognised and valued by social groups [19]. Corporate compensation is also a key component of an apology strategy [38, 39]. Such compensation may be in the form of material rewards or psychological gratification [19].

When presented with an apology, victims are likely to perceive the offender's sincerity, benevolence, and responsibility, appreciating the corporation's proactive efforts to repair its relationship with consumers following a crisis caused by misconduct. This approach facilitates customer forgiveness, thereby laying a solid foundation for the repair of trust [12].

2.2. Brand Trust Repair and Apology

Consumer brand trust refers to the willingness of consumers to endorse a brand based on positive expectations about the brand's intentions and its ability to fulfil commitments, especially when facing brand-related risks or uncertain consumer environments [40]. During a brand crisis, the key to repairing consumer trust lies in the consumers' belief that the corporate brand prioritises their welfare and provides meaningful benefits [41]. Despite significant efforts by corporations to earn consumer trust, trust violations frequently occur. Such violations occur when consumers perceive a discrepancy between the corporation's intentions and actions and their own expectations, leading to a sense that their interests have been harmed, resulting in a trust violation by the consumers [42, 43]. This is because the corporation's actions fail to meet consumer expectations or are inconsistent with the values held by consumers [44]. In the commercial relationship between corporations and consumers, trust violation refers to the breach of the psychological contract that underpins their mutual expectations and understanding [45, 46]. This can trigger negative responses in consumers' cognition, emotions, and behaviour—such as anger, confusion, and other negative emotions—ultimately leading to a decline in trust levels [47, 48]. The occurrence of trust violations can impose substantial economic and social costs on corporations [49]. As a result, studies examining the impact of trust violations on consumer trust often explore the concept of trust repair [50, 51], making trust repair an urgent issue for corporations to address [50].

Trust repair refers to the process of repairing and rebuilding trust after it has been damaged through a series of targeted measures [52]. This process is relevant in various relational contexts, including interpersonal relationships, corporate-consumer interactions, and even trust dynamics between individuals and artificial intelligence [52]. Consumer trust repair can be understood as the proactive crisis response behaviour adopted by a corporation to restore consumers' trust, following a credibility crisis. This is predicated on the fact that harm to consumer trust has already been caused by the corporation's negative actions [53].

A trust repair strategy refers to a series of steps and mechanisms implemented within inter-organisational networks to repair compromised trust relationships [54]. An apology is one of the most extensively studied and widely recognised strategies for trust repair, serving as a key mechanism to repair trust after violations occur [42, 55, 56]. Research confirms that apologies are highly effective for trust repair [57, 58], and they act as an essential component of corporate crisis management, positively influencing customer trust and satisfaction [59]. Empirical evidence consistently supports the constructive role of apologies in rebuilding trust [60, 61], and numerous studies have demonstrated that apologies are significantly more effective than other trust repair strategies [50, 62]. In the context of societal dilemmas, apologies play a critical role in re-establishing cooperative relationships. While acknowledging fault, expressing regret, and providing assurances to prevent future misconduct, apologies help alleviate public concerns about corporate behaviour, ultimately enhancing brand trust [50]. Additionally, studies suggest that apologies are particularly effective in repairing consumer trust in corporations, compared to their application in governmental contexts [63].

For an apology to effectively repair trust, it should incorporate multiple components, such as acknowledgement of violated norms, a commitment to restitution, and expressions of understanding and empathy towards victims [19, 64]. Incorporating these multi-dimensional components into an apology has been shown to significantly enhance its effectiveness [32, 36, 65]. Thus, the following hypothesis was proposed:

H1: *Apologies positively influence the repair of brand trust.*

2.3. Warmth and Competence of Stereotype Content Model (SCM)

The SCM is a binary system based on warmth and competence [66], which are widely used to assess individuals, groups, and various entities, shaping attitudes and guiding behavioural tendencies [29, 30, 67]. According to SCM theory, warmth encompasses traits such as sociability, friendliness, caring, and sincerity, while competence includes attributes such as skill, efficiency, instrumentality, and knowledge. Initially developed within the domain of social cognition to examine individuals and groups, the SCM has since been extended to various other fields, including product packaging and texture [68], advertising strategies [69], interpersonal strategies [70, 71], brand heritage [72] and virtual anchor appearance [73]. Studies have demonstrated that consumers' perceptions of warmth and competence in these contexts effectively predict their brand evaluations and behavioural intentions, highlighting the model's relevance in understanding consumer decision-making and brand-related judgments.

Warmth and competence are also applicable to the study of brand perception, as the SCM provides a structured framework to explain how consumers form brand perceptions through the two core social cognitive dimensions of warmth and competence [30, 74]. Warmth reflects consumers' perceptions of a brand's good intentions, encompassing attributes such as sincerity, empathy, and ethical responsibility, while competence refers to a brand's ability to fulfill these intentions through professionalism, efficiency, and problem-solving capability [74]. Warmth and competence have been independently and well validated as predictors of consumers' brand perceptions and purchase intentions [75-77].

In addition, the SCM has been applied to the analysis of the relationship between firms (or brands) and consumers. Research suggests that consumers tend to expect highly competent firms to exhibit strong crisis management capabilities and deliver effective solutions. At the same time, brands that evoke emotional resonance with consumers are more likely to be forgiven following a crisis and to develop stronger, more trustworthy relationships [78].

Emotional repair is a fundamental component of apology strategy aimed at repairing brand trust [16]. Expressing empathy is a vital element of an apology, as perceived empathy directly correlates with warmth [79]. Research indicates that apologies can enhance individuals' perceptions of warmth-related traits [70]. Further, the expression of sentiments such as understanding, empathy, remorse, and guilt through an apology is perceived by individuals (e.g., consumers) as indicative of sincerity, approachability, and a moral sense—all of which embody the essence of warmth [80-82]. These empathetic sentiments conveyed through an apology align closely with the concept of perceived warmth, suggesting that corporate apologies can significantly enhance consumer perceptions of warmth [83]. This, in turn, effectively mitigates consumers' negative sentiments and improves their impressions of the corporation in the aftermath of a crisis.

Scholars have also shown that apologies enhance perceptions of traits associated with competence [70]. Perkins et al. [84] highlight that when a trust violation occurs, an internal attribution apology—where the apologiser takes personal responsibility without blaming others—leads to higher perceived competence. An effective apology strategy should go beyond expressing empathy to include acknowledging mistakes and offering restitution. Functional repair is another critical element in an apology strategy for repairing brand trust [16]. This includes a corporation's courageous acknowledgement of errors, willingness to assume responsibility, commitment to measures preventing similar crises, and, when necessary, the provision of compensation. Such functional repair enables consumers to perceive a corporation's capacity for accountability. At the same time, providing compensation signals the corporation's operational strength, as economic compensation demonstrates substantial financial resources [12, 16].

As a result, during crisis management, an apology strategy aimed at repairing trust enhances consumers' confidence in the corporation's warmth and competence. These qualities form the core of consumer forgiveness and serve as the foundation for the ultimate repair of trust [85]. As such, the following hypotheses were proposed:

H2: *Apologies positively impact consumer perceived warmth.*

H3: *Apologies positively impact consumer perceived competence.*

The SCM theory underscores the importance of simultaneously considering perceived warmth and competence, as these dimensions are central to evaluating consumer brand trust in corporations [69, 86]. Research indicates that perceived warmth and competence significantly influence consumer behaviour, with higher levels of these perceptions yielding positive outcomes that are crucial for fostering trust [75, 87]. Scholars have demonstrated that consumer brand trust is strongly shaped by perceptions of warmth and competence. A brand perceived as warm is more likely to be viewed as honest and benevolent, aligning with the warmth dimension, which in turn enhances consumer confidence in its positive attributes [88]. Similarly, perceived competence, which reflects a brand's ability to fulfill its obligations, is a critical factor in shaping brand trust [89, 90]. These dimensions are vital for building

and sustaining consumer trust in a brand. A higher level of perceived competence tends to create more favourable conditions for the corporation, such as increased trust in the corporate brand [91, 92]. Therefore, the following hypotheses were proposed:

H4: Perceived warmth positively impacts brand trust.

H5: Perceived competence positively impacts brand trust.

Under the theoretical framework of SCM, perceived warmth and perceived competence serve as parallel mediators in the relationship between corporate apology and brand trust. When a corporation apologises, it expresses emotions such as regret and empathy, evoking a sense of warmth in consumers, which fosters a willingness to forgive [83]. Since trust repair is often grounded in forgiveness [12], perceived warmth plays a mediating role in this context, as confirmed by Imai [93]. At the same time, consumers recognise the corporation’s willingness to assume responsibility and its economic strength when it acknowledges the violation of norms and offers compensation, thus demonstrating its capabilities. This aligns with Choi et al., who argued that apologies that attribute responsibility to internal factors reflect the apologiser’s willingness to take responsibility for their shortcomings or mistakes, and their commitment to improvement, which in turn enhances perceptions of competence [94].

In summary, an apology strengthens brand trust by enhancing perceptions of both warmth and competence, as supported by H1/H2/H3 and H4/H5, confirming that apologies positively and directly impact brand trust repair. Therefore, the following hypotheses were proposed:

H6: Perceived warmth plays a partial mediating effect on the apology and brand trust.

H7: Perceived competence plays a partial mediating effect on the apology and brand trust.

Based on the above theoretical analysis and research hypotheses, a conceptual model was developed, as shown in Figure 1. This model reflects the research objectives of the present study, with the aim of exploring, which aim to explore the mechanisms by which corporate apology repairs brand trust from the perspective of consumer perception.

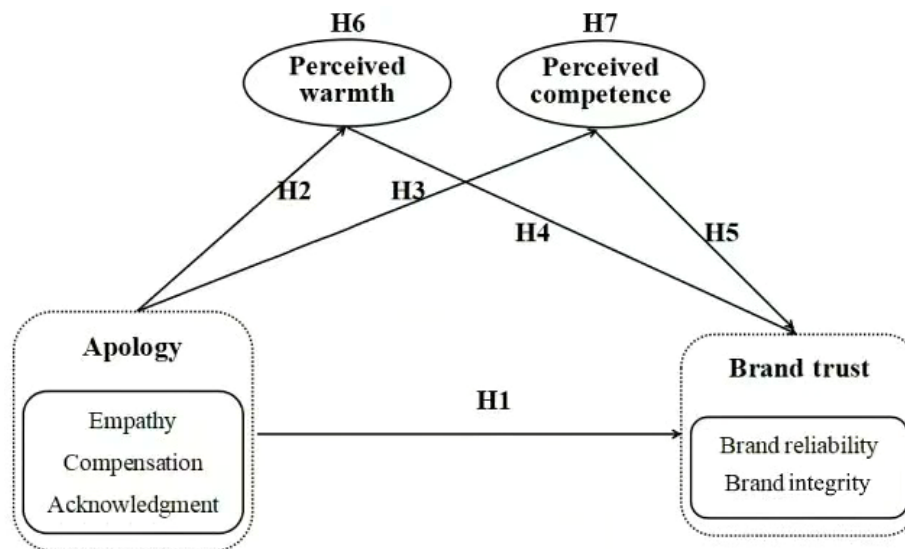


Figure 1. Conceptual Model

3. Research Methods

From the outset, the aim of the study was to establish a comprehensive understanding of the broader context of brand crises and to critically evaluate the existing body of research on apology strategies for brand trust repair, with the objective of identifying research gaps. Accordingly, the SCM was employed as the theoretical framework, and insights from prior literature on key constructs such as corporate apology, perceived warmth, perceived competence, and brand trust were synthesised. Based on this foundation, seven research hypotheses were formulated. Subsequently, empirical data were collected from consumers of new energy vehicles through a structured questionnaire survey. The collected data were analysed using SPSS and AMOS software to test the proposed hypotheses. The results were systematically examined, followed by an interpretation of the findings and the derivation of conclusions. Finally, the broader implications of these findings in the context of crisis response strategies and corporate practice were explored. A comprehensive flowchart outlining the research methodology is presented in Figure 2.

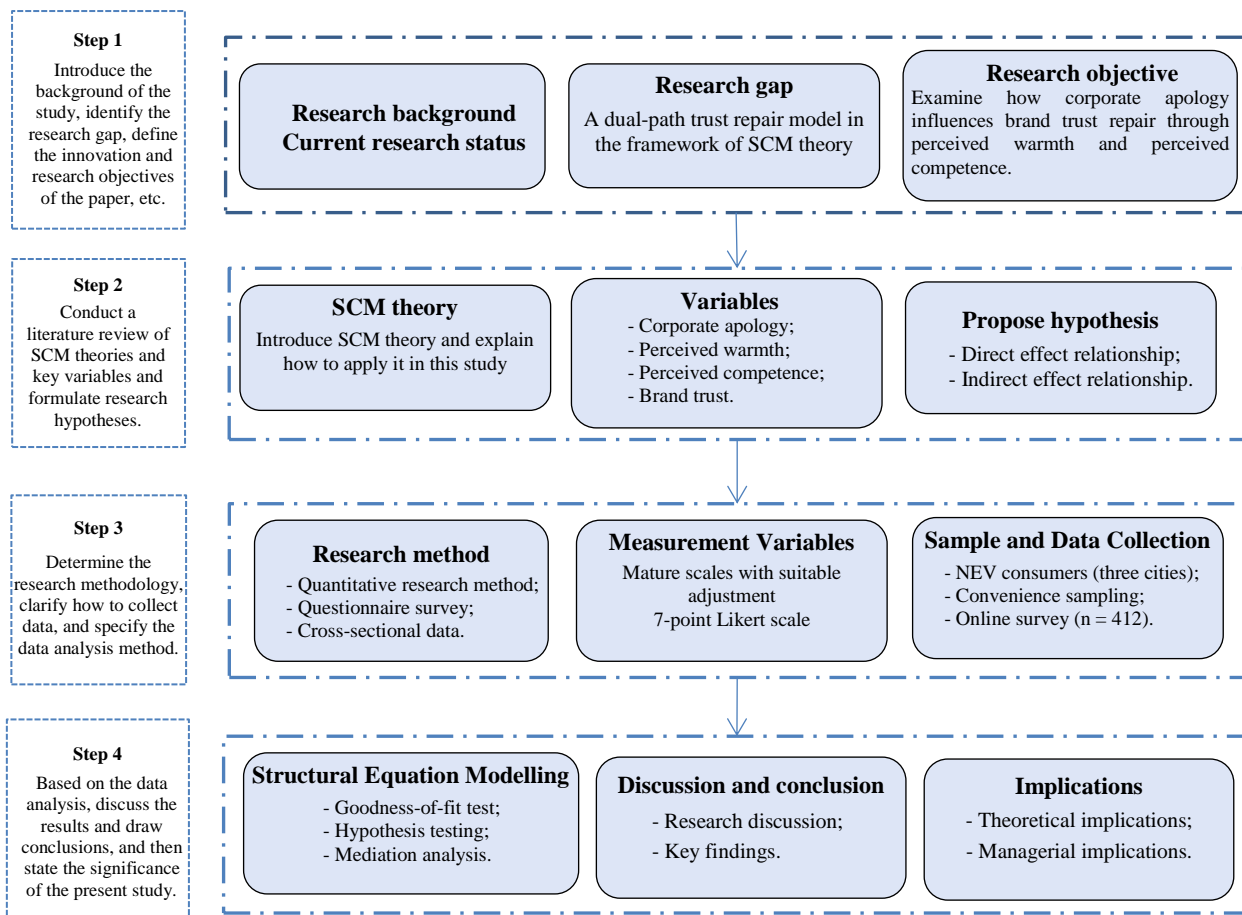


Figure 2. Research Methodology Flowchart

3.1. Measures

In the present study, cross-sectional empirical data was collected via questionnaire surveys, where participants were first provided with an introduction and background information before completing the survey. Following the recommendations of Dahlén & Lange [95], a moderate-level brand crisis was adopted as the background scenario for the survey. This aligns with real-world crisis cases, which are typically not extreme. Additionally, the crisis response company was assumed to be a well-known firm in China's new energy vehicle market, thereby ensuring that respondents shared a relatively consistent level of brand awareness, reducing potential biases caused by differences in brand perception. The questionnaire assessed variables including apology, perceived warmth, perceived competence, brand trust, and demographic details such as age, gender, income, and education. In the context of a brand crisis, an apology was regarded as a corporation's expression of empathy and provision of an explanation for the error, acknowledging responsibility and offering reparations to consumers [65, 96]. The measurement of apology was adapted from the scale developed by Fehr & Gelfand [19], which encompasses three dimensions: empathy, compensation, and acknowledgement, comprising a total of thirteen items. Perceived warmth, as outlined by Fiske et al. [29], refers to the benevolent intentions consumers attribute to a brand following an apology strategy, and this was measured using the established five-item scale developed by Fiske et al. [29].

Perceived competence, reflecting consumers' evaluations of the brand's ability to fulfil its stated intentions after issuing an apology, was also assessed using the same five-item scale. Brand trust, as defined in this study, pertains to consumers' willingness to endorse a brand based on their positive expectations regarding the brand's intentions and its ability to meet its commitments, particularly during a crisis, aligning with insights from previous scholars [40, 96]. Brand trust was measured using the two-dimensional scale developed by scholars Gurviez & Korchia [97], comprising a total of eight items. The first dimension was brand reliability, which pertained to the brand's commitment and capability to meet consumer needs. The second dimension was brand integrity, characterised by key elements such as consistency, honesty, and ethical responsibility. Minor adaptations were made to the measurement scale to enhance its relevance to the objectives of the present study. The α value of all maturity scales was over 0.7, indicating a high level of reliability for scales [98]. The measurement items in the questionnaire were rated using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree, and so on). However, this approach presented challenges, as the scales were originally developed in

English literature, whereas the survey targeted Chinese consumers. To address this issue, the study adhered to Brislin's recommendation [99], employing a rigorous process of translation and back-translation to ensure the accurate conveyance of the original intent of the scale designers.

3.2. Sample and Data Collection

China is the world's largest consumer market and the leading producer and distributor of new energy vehicles, with the highest global rankings in production, sales volume, and consumer base. The present study was conducted in China, the largest market for new energy vehicles, to generate insights applicable to the industry in other countries. Data were collected from consumers in Shanghai, Shenzhen, and Beijing, selected based on three key considerations. First, as of 2023, these cities had the highest number of new energy vehicle consumers in China [100], ensuring that the study encompassed the primary consumer demographic and enhanced external validity. Second, these cities are located in economically advanced regions and serve as the core market for the new energy vehicle industry, standardised by a substantial concentration of consumers with high purchasing power, making them representative of national consumption trends and brand preferences. Third, Shanghai, Shenzhen, and Beijing were among the earliest adopters of new energy vehicles in China, benefiting from favourable policies and high consumer acceptance, making them ideal for examining consumer trust repair mechanisms with significant implications for the industry. Although data collection was limited to these three cities, their geographic distribution—Shanghai in the east, Shenzhen in the south, and Beijing in the north—ensures representation of diverse consumer groups across China. This selection provided a more comprehensive reflection of national consumer behaviour, enhancing the representativeness of the sample and improving the applicability of the findings within the Chinese market.

The research population for the study consisted of electric vehicle consumers in Shanghai, Shenzhen, and Beijing, with a total of 3,229,396 consumers in these cities (2023 data). The sample size was determined using the Yamane formula [101], which balances research precision and sample size. With a confidence level of 95% and a margin of error of 5%, the minimum required sample size was 400 participants. The convenience sampling method was utilised to distribute questionnaires to consumers of new energy vehicles in Shanghai, Shenzhen, and Beijing. Respondents in the survey were considered to belong to approximately homogeneous units. To facilitate participation, survey links or QR codes were disseminated via instant messaging platforms such as QQ and WeChat, ensuring that all questionnaires were completed anonymously and with appropriate compensation. The distribution of questionnaires was carried out through three main channels. First, questionnaires were distributed at exclusive stores for new energy vehicles in Shanghai, Beijing, and Shenzhen. These stores were selected as they directly connected with potential buyers and those requiring after-sales services, making them hubs where the target population was highly concentrated. Additionally, store staff were able to assist with questionnaire distribution. Second, the author joined online social media groups for new energy vehicle owners in these cities, typically hosted on QQ or WeChat. Members of these groups, primarily purchasers and users of new energy vehicles, were invited to participate by accessing the survey through links or QR codes. Third, the author enlisted the help of friends, classmates, and relatives residing in the three cities to distribute the questionnaire via QQ or WeChat Moments, encouraging individuals who had purchased or used new energy vehicles to complete it. This approach leveraged established trust to facilitate the collection of data from eligible respondents.

Following the method recommended by Oppenheimer [102], a single trap question was included at the end of each questionnaire to assess the attentiveness of respondents; any incorrect response to this question rendered the questionnaire invalid. Additionally, a quality check for multivariate outliers was conducted in accordance with the guidelines of Tabachnick [103], and questionnaires completed in less than two minutes were excluded from the dataset. Ultimately, 502 respondents participated in the survey, and 436 questionnaires were collected, yielding a response rate of 87%. After screening, 412 valid questionnaires were retained, resulting in an effective response rate of 82%. Of these, 249 were completed by male respondents and 163 by female respondents. Approximately 35% of the respondents were aged below 35, while the remaining were aged 35 or older.

3.3. Common Method Bias (CMB)

Cross-sectional data was collected, with the questionnaire survey serving as the sole data source. To ensure the internal validity of the research findings, the widely used Harman single-factor method was employed to test for common method bias [104]. The results, presented in Table 1, indicate that there were seven factors with eigenvalues exceeding 1. The initial variance explained by the largest factor was 27.516%, below the critical threshold of 50%. Consequently, the results suggest that the study was not significantly affected by common method bias.

Table 1. Harman’s Single-Factor Test

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.530	27.516	27.516	8.530	27.516	27.516	3.514	11.336	11.336
2	3.992	12.878	40.394	3.992	12.878	40.394	3.388	10.928	22.264
3	3.077	9.925	50.319	3.077	9.925	50.319	3.363	10.850	33.114
4	2.335	7.531	57.850	2.335	7.531	57.850	3.053	9.847	42.961
5	1.531	4.938	62.788	1.531	4.938	62.788	2.985	9.628	52.589
6	1.379	4.448	67.236	1.379	4.448	67.236	2.811	9.066	61.655
7	1.035	3.339	70.576	1.035	3.339	70.576	2.765	8.920	70.576
8	.627	2.024	72.599						
9	.594	1.917	74.516						
10	.573	1.848	76.364						
11	.529	1.707	78.071						
12	.485	1.565	79.636						
13	.468	1.510	81.146						
14	.463	1.493	82.639						
15	.450	1.452	84.091						
16	.434	1.400	85.491						
17	.405	1.306	86.797						
18	.389	1.253	88.050						
19	.379	1.223	89.273						
20	.369	1.189	90.463						
21	.360	1.162	91.624						
22	.328	1.059	92.684						
23	.307	.990	93.674						
24	.302	.974	94.648						
25	.278	.896	95.544						
26	.274	.884	96.428						
27	.252	.813	97.241						
28	.248	.801	98.042						
29	.219	.708	98.750						
30	.203	.654	99.404						
31	.185	.596	100.000						

Extraction Method: Principal Component Analysis.

4. Empirical Analysis and Results

4.1. Reliability and Validity

Guided by the practice of Anderson & Gerbing [105], a two-step approach was employed to examine the reliability and validity of the variables.

Firstly, according to the analysis results in Table 2, the Cronbach’s α values for all variables exceeded the widely accepted threshold of 0.7, demonstrating strong internal consistency, and the Composite Reliability (CR) values surpassed the critical threshold of 0.7, further confirming the reliability of the measurement model. Secondly, all factor loadings were greater than 0.5, and the Average Variance Extracted (AVE) values exceeded 0.5, signifying good convergent validity of each variable [106]. The findings confirm that all items effectively supported the convergent validity of the measurement model. Overall, the results provide robust empirical support for the reliability and validity of the measurement variables, ensuring the appropriateness of the scales used in the study.

Table 2. Results of Reliability and Convergent Validity Analysis

Construct	Dimension	Items	Cronbach's α	Standardised Factor loading	CR	AVE
Apology	Empathy	EP1	0.859	0.730	0.860	0.551
		EP2		0.719		
		EP3		0.769		
		EP4		0.754		
		EP5		0.737		
	Acknowledgement	AK1	0.911	0.846	0.911	0.719
		AK2		0.819		
		AK3		0.852		
		AK4		0.874		
	Compensation	CP1	0.902	0.836	0.903	0.699
		CP2		0.829		
		CP3		0.843		
		CP4		0.835		
Perceived warmth		PW1	0.887	0.769	0.940	0.612
		PW2		0.781		
		PW3		0.770		
		PW4		0.778		
		PW5		0.812		
Perceived competence		PC1	0.869	0.638	0.871	0.576
		PC2		0.766		
		PC3		0.797		
		PC4		0.815		
		PC5		0.767		
Brand trust	Brand reliability	BR1	0.867	0.867	0.867	0.620
		BR2		0.839		
		BR3		0.867		
		BR4		0.839		
	Brand integrity	BI1	0.838	0.867	0.839	0.566
		BI2		0.839		
		BI3		0.867		
		BI4		0.839		

Note: N=412

Further, to evaluate discriminant validity of variables, the Fornell-Larcker criterion was applied [106]. As presented in Table 3, the square roots of each variable's AVE values all exceeded 0.6 and was consistently higher than its correlation coefficients with other variables, indicating a low degree of inter-construct correlation. Meanwhile, each variable independently accounted for the variances of its respective measurement indicators [107], confirming its empirical distinctiveness from other variables and demonstrating that the measurement indicators exhibit satisfactory discriminant validity. Consequently, the discriminant validity of the model was empirically supported, further reinforcing the robustness of the measurement instrument.

Table 3. Correlation analysis and discriminant validity

Variables	EP	AK	CP	PW	PC	BR	BI
EP	(0.742)						
AK	0.601	(0.848)					
CP	0.540	0.579	(0.836)				
PW	0.184	0.312	0.369	(0.782)			
PC	0.15	0.124	0.339	0.364	(0.76)		
BR	0.293	0.248	0.282	0.291	0.281	(0.787)	
BI	0.214	0.127	0.258	0.279	0.266	0.724	(0.752)
Mean	3.55	4.07	4.15	4.21	4.13	4.13	4.15
Std. Deviation	1.68	1.96	1.96	1.83	1.73	1.55	1.79

Note: The values within the brackets along the diagonal represent the square root of the AVE.

4.2. Structural Equation Modelling Analysis and Hypothesis Testing

AMOS 23 was used to conduct structural equation modelling (SEM) to further validate the repair effect of corporate apology on brand trust. The structural equation model is illustrated in Figure 3.

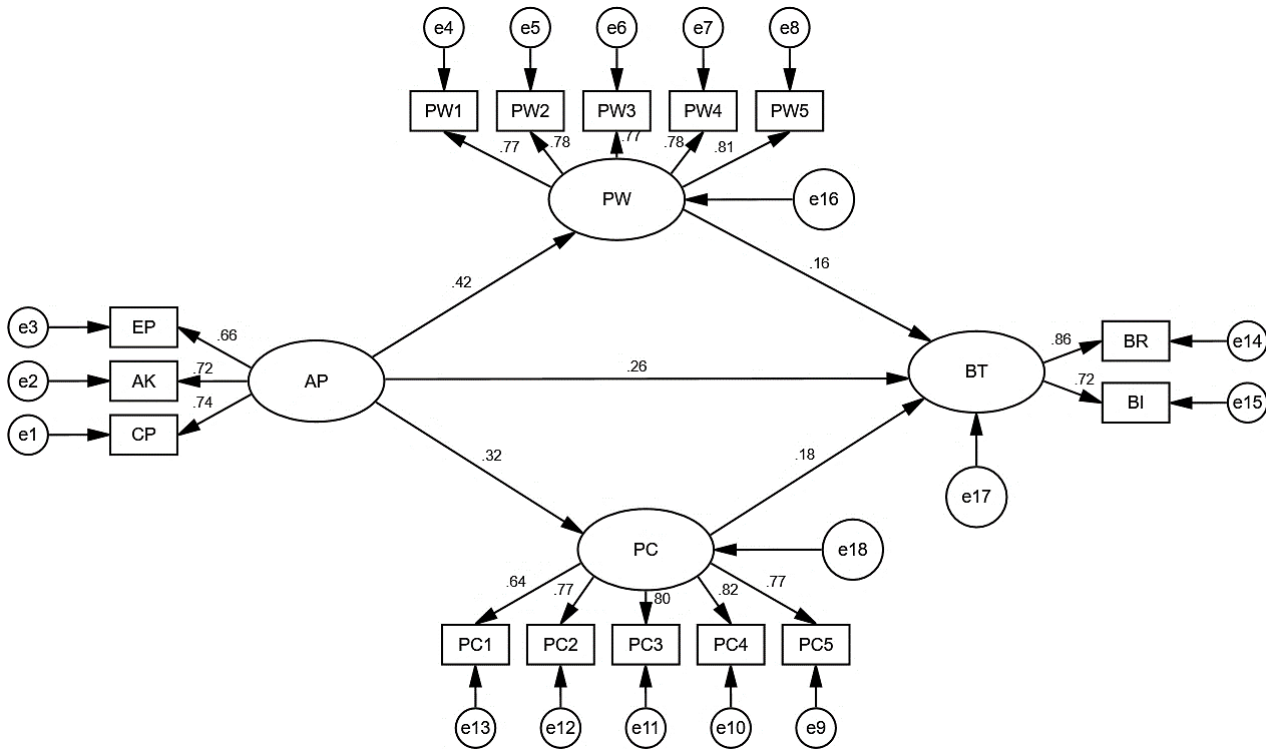


Figure 3. Structural Equation Modelling

4.2.1. Model Test of Goodness for Fit

Firstly, the goodness of fit of the established model was tested to assess the validity of the model assumptions, facilitating subsequent hypothesis testing. Several key goodness-of-fit indicators, as shown in Table 4, were evaluated to determine whether the model met the recommended standards. The results indicate that the goodness-of-fit metrics obtained from the software operation were as follows: The CMIN/DF value of 1.604 (<5.0) indicates a strong alignment between the hypothetical model and the actual data, confirming a good model fit. Additionally, the goodness-of-fit index (GFI = 0.957), Tucker-Lewis index (TLI = 0.976), and comparative fit index (CFI = 0.981) exceeded the recommended threshold of 0.9, demonstrating that the model structure possesses high explanatory power and robustness. Further, the root mean square error of approximation (RMSEA = 0.038) and standardised root mean square residual (SRMR = 0.0758) remained below the 0.08 threshold, indicating low residual error and a reliable representation of the observed data. These values align with the fit criteria proposed by Hu & Bentler [108], confirming that the model exhibited strong overall goodness of fit.

Table 4. Goodness-of-Fit for Structural Equation Modelling

Fitness Index	Critical Value	Test Data of First-order	Fitness Judgement
CMIN/DF	<5	1.604	Yes
GFI	>0.8	0.957	Yes
TLI	>0.9	0.976	Yes
CFI	>0.9	0.981	Yes
RMSEA	<0.08	0.038	Yes
SRMR	<0.08	0.0758	Yes

Together, the results confirm that the model was able to adequately represent the observed empirical data, ensuring that subsequent hypothesis tests were conducted within a statistically valid and well-fitting framework, enhancing the reliability of subsequent hypothesis tests, and providing a solid empirical foundation for subsequent findings.

4.2.2. Direct Effects Analysis

The causal relationships among variables were analysed using parameter estimates provided by the AMOS software to test the validity of the hypotheses. The results, as summarised in Table 5, provide strong empirical support for the proposed hypotheses. The findings confirm that corporate apology has a significant positive effect on brand trust ($\beta = 0.276, t = 3.574, P < 0.05$), thereby confirming H1. This suggests that corporate apologies play a crucial role in repairing brand trust, highlighting the significance of a corporation’s strategic response to crises. Additionally, corporate apology significantly enhances both consumer perceived warmth (PW) ($\beta = 0.490, t = 6.618, p < 0.001$) and consumer perceived competence (PC) ($\beta = 0.359, t = 5.087, p < 0.001$), supporting H2 and H3. These findings align with the Stereotype Content Model (SCM), which suggests that individuals evaluate corporate apology strategies based on two fundamental social dimensions: perceived warmth (expressing empathy and care) and perceived competence (acknowledging violation of norms and committing to compensation). Further, increases in consumer perceived warmth significantly enhanced brand trust ($\beta = 0.141, t = 2.483, P < 0.05$), and improvements in consumer perceived competence similarly resulted in a significant boost to brand trust ($\beta = 0.166, t = 3.010, P < 0.05$), thus validating H4 and H5. This suggests that both affective perception factors and competence perception factors had a positive effect on brand trust repair.

Table 5. Variable Path Coefficients

Hypotheses	Path	BETA	SE	t	P	Support
H1	AP→BT	0.276	0.077	3.574	***	Yes
H2	AP→PW	0.490	0.074	6.618	***	Yes
H3	AP→PC	0.359	0.071	5.087	***	Yes
H4	PW→BT	0.141	0.057	2.483	0.013*	Yes
H5	PC→BT	0.166	0.055	3.010	0.003**	Yes

Notes: (1) N = 312. (2) *p < .05. **p < .01. ***p < .001.

Overall, the results of the direct effect analysis support the theoretical framework of this study, indicating that corporate apology enhanced brand trust both directly and indirectly through the mediating pathways of perceived warmth and perceived competence. These findings establish a basis for subsequent mediation analysis to further investigate the underlying mechanisms of trust repair.

4.2.3. Mediating Effect Analysis

To assess the mediating roles of perceived warmth (PW) and perceived competence (PC) in the relationship between corporate apology (AP) and brand trust (BT), SEM with bootstrapping was employed. The Bootstrap method [109] was employed to estimate the confidence intervals of each coefficient, ensuring the robustness of the mediation analysis and assessing the mediating roles of perceived warmth and perceived competence in the relationship between corporate apology and brand trust. The results, presented in Table 6, indicate that the total effect of corporate apology on brand trust was 0.404, with a 95% confidence interval of (0.258, 0.556), which does not include 0, confirming a significant overall relationship. The direct effect of corporate apology on brand trust was 0.276, with a 95% confidence interval of (0.106, 0.445), which does not include 0, indicating that corporate apology has a substantial direct impact on brand trust, accounting for 68.3% of the total effect. Regarding perceived warmth, the indirect effect of corporate apology on brand trust was 0.069, with a 95% confidence interval of (0.01, 0.136), also excluding 0, suggesting that perceived warmth partially mediates the relationship, thereby supporting H6. This finding implies that corporate apologies not only directly enhance brand trust but also shape consumers’ perceptions of warmth, which is further strengthened when companies express empathy and care toward victims during a crisis. Similarly, the indirect effect of perceived competence in the relationship between corporate apology and brand trust was 0.06, with a 95% confidence interval of (0.022, 0.115), which also excluded 0, indicating that perceived competence serves as a partial mediator, thus supporting H7. This suggests that corporate apologies contribute to trust repair by reinforcing perceptions of competence, as acknowledging norm violations and committing to compensatory actions enhance consumer trust.

Table 6. Mediating Effect Results (N=412)

Path	Effect type	Effect	SE	BootLLCI	BootULCI	Relative effect
AP→BT	Total	0.404	0.075	0.258	0.556	100%
AP→BT	Direct	0.276	0.086	0.106	0.445	68.3%
AP→PW→BT	Indirect	0.069	0.031	0.010	0.136	17.1%
AP→PC→BT	Indirect	0.060	0.023	0.022	0.115	14.9%

The findings underscore the pivotal roles of perceived warmth and perceived competence in the process of brand trust repair, aligning with the core principles of the SCM applied in the present study. According to the SCM, brands in crisis influence consumer trust repair through two fundamental dimensions: perceived warmth, which fosters emotion-based trust through expressions of empathy and care, and perceived competence, which drives responsibility-based trust through accountability and commitments to compensation. While direct effects account for the majority of trust repair (68.3%), indirect effects via perceived warmth (17.1%) and perceived competence (14.9%) further reinforce the process. Within the SCM framework, trust repair follows a dual-pathway mechanism rooted in individual psychological perception, wherein consumers assess corporate apologies based on their perceptions of warmth and competence.

Referring to Chin et al., the reliability of the results had to be further confirmed [110]. In the present study, hierarchical regression was used to test the mediating effect. The results, as shown in Table 7, indicate that even after controlling for variables such as gender, age, education, and income, the direction and significance of the mediated relationships remained consistent. The findings suggest that the mediation effect of corporate apologies on brand trust through perceived warmth and perceived competence was robust. Moreover, the increase in R² values after incorporating the mediators demonstrated an improvement in the model’s explanatory power, reinforcing the reliability and validity of the mediation analysis. This result is consistent with the bootstrap method findings, providing additional empirical support for the robustness of the mediation effects. The convergence of results across multiple statistical techniques enhanced the credibility of the study’s conclusions and strengthened their generalisability to broader contexts.

Table 7. Robustness Analysis Results of Mediating Effects

	BT	PW	BT	PC	BT
AP	0.281***(5.907)	0.308***(6.512)	0.217***(4.433)	0.229***(4.746)	0.232***(4.852)
PW			0.208***(4.241)		
PC					0.216***(4.505)
Gender	0.033(0.675)	-0.008(-0.172)	0.034(0.725)	0.06(1.236)	0.02(0.414)
Age	-0.037(-0.766)	-0.058(-1.217)	-0.025(-0.525)	-0.014(-0.28)	-0.034(-0.721)
Education	0.048(1.008)	-0.033(-0.695)	0.055(1.174)	-0.003(-0.062)	0.049(1.045)
Income	0.016(0.326)	0.002(0.032)	0.015(0.326)	-0.08(-1.644)	0.033(0.699)
R2	0.086	0.099	0.125	0.063	0.130
p	0.000	0.000	0.000	0.000	0.000

5. Discussion and Conclusion

5.1. Discussion

The findings of this study indicate that corporate apologies have a significant positive impact on brand trust, supporting their effectiveness as a trust repair strategy [9, 10, 11, 61]. This result is consistent with previous studies [25, 111], which suggest that apologies not only mitigate consumers' negative emotions but also enhance their confidence in the brand’s future performance. Notably, consumer trust in a brand is not a static evaluation [112]; rather, it is influenced by both the attitude conveyed in an apology and the subsequent remedial actions taken by the company. A mere verbal apology is insufficient—effective trust repair requires a comprehensive approach that integrates concrete actions such as commitments to improvement, transparent crisis management, and financial compensation [19, 64]. These corrective measures are essential to repairing consumer trust and reinforcing the credibility of the apology.

In addition, it was found that corporate apologies significantly enhance consumers’ perceived warmth and perceived competence; the result validates previous studies [70, 83]. The increase in perceived warmth in the context of brand crisis suggests that brands are effective in mitigating consumer emotional conflict by conveying goodwill and empathy through apologies. This result supports Huang & Wilkinson’s [112] assertion that corporate apologies play a crucial role in reducing consumer hostility. Furthermore, the observed increase in perceived competence suggests that consumers assess a brand’s financial strength and crisis management capabilities when evaluating its response to a crisis. According to Alboqami, expertise and authenticity enhance consumer confidence in a brand’s competence [113], a perspective that aligns with the findings of the present study. Specifically, firms that accompany their apologies with demonstrable problem-solving capabilities, such as commitments to improvement and financial compensation, are more effective in repairing brand trust [12]. This highlights the importance of not only issuing an apology but also reinforcing it with tangible actions that signal accountability and a commitment to rectifying the situation.

The present results also indicate that both perceived warmth and perceived competence had a significant positive effect on the repair of brand trust. This result is consistent with the studies confirming the applicability of SCM in brand trust repair [30, 88]. However, the effects of perceived warmth and perceived competence on trust are not always simultaneously significant, as their influence may vary depending on specific conditions or relational contexts [114,

115]. This indicates that in brand crisis management, companies should tailor their response strategies based on contextual factors to optimise trust repair while minimising costs. By strategically emphasising either warmth or competence, depending on consumer expectations and the nature of the crisis, brands can implement more effective and resource-efficient recovery measures.

Further research revealed that perceived warmth and perceived competence play a significant partial mediating role in the relationship between corporate apology and brand trust. This finding suggests that the trust-repairing effects of corporate apologies are not solely driven by direct influence; rather, a substantial portion of trust repair depends on consumers' psychological perceptions, specifically, whether the apology enhances their perception of the brand's warmth and competence. A corporate apology fosters an emotional connection between the brand and consumers through emotional resonance while also reinforcing the brand's competence by demonstrating economic strength or a commitment to responsibility. As a result, apologies contribute to trust repair through two complementary mechanisms: they elicit consumer forgiveness by enhancing perceived warmth [83] and simultaneously strengthen trust by reinforcing the brand's perceived ability to address the issue [16, 12]. This dual-pathway mechanism underscores the importance of a balanced apology strategy. Firms can maximise brand trust repair by simultaneously enhancing consumers' perceptions of warmth and competence when formulating their apology responses, ensuring both emotional reassurance and confidence in the brand's ability to resolve crises effectively.

Overall, the present study not only verifies the effectiveness of apology as a trust repair strategy but also provides a more systematic theoretical explanation through the SCM, revealing how apology affects the repair of brand trust through the psychological cognitive mechanism of consumers. This finding holds significant practical implications for brand crisis management, indicating that companies should adopt a dual-faceted approach to trust repair. Specifically, organisations must not only address consumers' emotional needs by demonstrating empathy and sincerity during the apology process but also reinforce consumer confidence in the brand by showcasing their competence and commitment to corrective actions. By integrating emotional reassurance with tangible demonstrations of accountability, such as transparent crisis resolution, strategic improvements, and compensation measures, companies can develop a more effective and comprehensive trust repair strategy, ultimately fostering stronger consumer trust and brand resilience.

5.2. Conclusion

This study develops and validates a theoretical model of corporate apology in relation to the repairing of brand trust, grounded in the Stereotype Content Model (SCM). Employing quantitative research methods, the present study explores how consumers assess corporate apologies through perceived warmth and perceived competence in brand crisis contexts and further examines their impact on the repairing of brand trust. The findings indicate that corporate apologies not only directly enhance brand trust but also contribute indirectly to trust repair by enhancing consumers' perceptions of warmth and competence towards the brand. Specifically, corporate apologies significantly improve consumers' perceptions of warmth—characterised by empathy, care, and understanding—as well as their perceptions of competence, demonstrated through accountability and commitment to compensation. The result suggests that an apology in crisis management functions not merely as a means of emotional appeasement but also as a trust-repairing mechanism that integrates elements of competence, allowing corporations to repair brand trust on both emotional and rational levels.

Moreover, this study reveals that perceived warmth and perceived competence play a partially mediating role between corporate apology and brand trust, thereby reinforcing the dual-path mechanism of trust repair within the SCM theoretical framework. The trust repair driven by perceived warmth underscores the importance for brands to convey emotional resonance during crisis management. In contrast, the trust repair driven by perceived competence indicates that consumers are concerned not only with a brand's crisis attitude but also with its capability to effectively address the crisis. This study is expected to offer a valuable framework for future research in the domain of brand crisis management and serve as a useful reference for corporations in formulating their crisis response strategies.

6. Implications

6.1. Theoretical Implications

Previous studies have mainly focused on the constraint mechanisms for distrust and demonstration mechanisms for trust, with less attention paid to the internal psychological evaluation mechanisms of consumers during the trust repair. In contrast, a novel perspective was introduced in the present study, which extends the research on trust repair mechanisms. To be specific, grounded in SCM, a dual-dimensional pathway was proposed for trust repair: warmth and competence. This indicated that consumers assessed corporate apologies both emotionally and rationally and further suggested that trust repair is not a singular, pathway-dependent process but rather a multidimensional psychological and cognitive process. Clearly, consumer personal perception emerged as a novel perspective in the present study, enriching existing research and providing a fresh interpretative framework for understanding trust repair.

In addition, based on SCM theory, warmth and competence were introduced as mediating variables into the research model. Originally applied in social psychology, SCM theory has since been widely adopted in marketing; however, its application in the development of crisis response strategies has been limited. In the present study, these two variables were used to evaluate corporate apology strategies, with warmth and competence conceptualised as the consumer's perceived warmth and perceived competence of the brand following the corporate apology. This approach revealed the cognitive response mechanisms of consumers during brand crises. In conclusion, the repair of consumer brand trust is not solely influenced by the corporate apology itself but also by the warmth and competence embedded within the apology. This finding further extends the application of SCM theory in consumer behaviour, demonstrating that the model is relevant for exploring interpersonal relationships and effectively explaining the trust repair process between corporate brands and consumers.

6.2. Managerial Implications

The findings of the present study reveal a positive impact on corporate management. Firstly, in the event of a brand crisis, brand trust repair is significantly and positively correlated with customer perceptions of warmth and competence. Consequently, firms should prioritise refining their apology strategies to enhance consumers' perceptions of corporate warmth and competence. Warmth can be understood as the firm's expression of understanding and care towards consumers, such as showing empathy, which is deeply reassuring for consumers who value emotional experiences. In contrast, competence reflects the firm's ability and efficiency in addressing the trust crisis, such as making commitments or offering compensation. Corporate competence assures consumers, particularly those who place high value on the resolution of practical issues, that the firm is capable of effectively addressing their concerns and safeguarding their interests. In light of such findings, corporate leaders are advised to strengthen the emotional elements of an apology to demonstrate sincerity towards consumers. Simultaneously, they must prove their capability to correct past mistakes and offer viable solutions to enhance consumer perceptions of both warmth and competence, thereby facilitating the repair of brand trust. In recent years, customer experience has gained significant importance for firms, aligning with the customer-centric brand concept in the market [93]. However, some firms may neglect the importance of customer experience, which is a critical misstep, as it allows the breach of trust to worsen unchecked. The reasons for this oversight are often related to the belief that addressing a crisis will incur high economic costs or a misplaced assumption that the crisis will eventually resolve itself over time. By adopting such an approach, firms risk overlooking the potential loss of consumer support and the competitive disadvantages that may follow.

Secondly, in terms of different brand contexts or brand crises, the weight given to the dimensions - warmth and competence may differ. Apology strategies should be tailored to reflect the specific realities of the brand, emphasising either the firm's warmth or competence, in order to enhance consumers' perceptions of these qualities. For example, technology-orientated brands might focus on showcasing their capabilities in resolving issues, while service-driven brands should prioritise conveying warmth and empathy to consumers. By adopting differentiated apology strategies, firms can offer targeted services that address the psychological needs of consumers, thereby effectively repairing brand trust. In summary, firms facing a brand crisis should move away from the narrow principle of minimising economic costs and instead incorporate consumers' psychological responses into their crisis management framework, fostering long-term brand development.

7. Limitations and Prospects

The present findings offer valuable contributions to corporate brand crisis management from theoretical and practical perspectives. However, there are certain limitations that should be addressed in future research.

Firstly, the sample data in the present study was collected from new energy vehicle firms, potentially limiting the generalisability of the research conclusions. Different industries experience various types of crises, each with distinct focuses on corporate apology strategies and consumer reactions. Therefore, future research could broaden the scope to include firms from other sectors, such as fast-moving consumer goods or high-tech industries, to conduct empirical analyses. This would help validate whether the research findings are applicable across different industries, thereby enhancing the generalisability and universality of the results.

Secondly, the cross-sectional data collected through the questionnaires fails to fully capture the dynamic process of brand trust repair. Future research could address this limitation by employing longitudinal study designs, such as tracking studies or experimental designs, to collect data over multiple stages. This would allow for a more comprehensive examination of the dynamic process of trust repair, providing empirical support with greater temporal validity.

Finally, the focus of the present study was on the direct and mediating effects of corporate apology on brand trust, without examining the multiple factors that firms may face in decision-making processes. To better reflect the complexity of real-world scenarios, future research could incorporate variables such as crisis types, cultural characteristics, and consumer personality traits as moderating factors to further examine the applicability of corporate apology strategies across more diverse crisis contexts and their impact on various stakeholders. In conclusion, the research presented contributes to enriching the theoretical framework of brand crisis management and provides practical guidance for firms in making optimal decisions during various crises.

8. Declarations

8.1. Author Contributions

Conceptualization, M.R.Y., S.P., and S.Z.B.; methodology, M.R.Y. and S.P.; software, M.R.Y.; validation, M.R.Y., S.P., and S.H.Z.; formal analysis, M.R.Y. and S.P.; investigation, M.R.Y.; resources, M.R.Y. and S.P.; data curation, M.R.Y.; writing—original draft preparation, M.R.Y. and S.P.; writing—review and editing, M.R.Y., S.P., and S.H.Z.; visualization, M.R.Y. and S.P.; supervision, S.P. and S.Z.B.; project administration, S.P. and S.Z.B.; funding acquisition, M.R.Y. and S.P. All authors have read and agreed to the published version of the manuscript.

8.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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8.5. Institutional Review Board Statement

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8.6. Informed Consent Statement

Not applicable.

8.7. Declaration of Competing Interest

The authors declare that there are no conflicts of interest concerning the publication of this manuscript. Furthermore, all ethical considerations, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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