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Beyond Service Recovery Performance: Humble Leadership and Psychological Safety as Durable Resources for Sustainable Service Management and Organizational Resilience

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Abstract

This study empirically examines the effects of humble leadership on service recovery performance, mediated by psychological safety, within the context of food-service operations. This research advances sustainable service management theory by identifying how leader humility and psychological safety function as durable resources that support sustainable frontline operations and organizational resilience over time. Using a structural equation model, data collected through a survey of restaurant employees reveal that humble leadership has a significant positive influence on psychological safety, facilitating a subsequent constructive impact on service recovery performance. Psychological safety, in turn, exerts a significant positive effect on service recovery performance and serves as a vital mediator in the relationship between humble leadership and service recovery performance. These results suggest that humble leadership encourages workers to respond more actively and flexibly to service failures by fostering a psychologically safe organizational environment. From a sustainability perspective, this study demonstrates that leadership-based psychological assets are critical for maintaining consistent service quality and long-term customer trust. Academically, this study expands similar research by integrating the relationship among humble leadership, psychological safety, and service recovery performance into a sustainable service management framework. Practically, the findings suggest that embedding humble leadership within the organizational culture secures long-term performance by strengthening employees' psychological stability and autonomous problem-solving capabilities.

Keywords: humble leadership; psychological safety; recovery performance; food-service companies

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1. Introduction

Food-service companies face intensified competition due to globalization, digital transformation, and rising customer expectations, and service failures also frequently occur in this environment [1,2]. Such failures not only cause customer complaints and negative emotions but also lead to negative word of mouth and breakaway behavior, directly affecting corporate performance [2]. Consequently, there is increasing interest in service recovery performance to restore customer relationships and reframe satisfaction after service failure [3]. Service recovery performance goes beyond simple problem-solving and is

closely linked to customer satisfaction, revisit intention, and long-term relationship maintenance [4]. Food-service companies are a high-contact industry where services are produced and consumed simultaneously, and the roles of organizational members are an important factor in determining service quality [5]. In service failure situations, the organizational members' response methods and problem-solving processes affect customer perception of fairness and trust [6]. While traditional research has emphasized standardized manuals for recovery, this study focuses on the 'human factor'—specifically, the internal psychological resources of frontline employees that enable flexible and autonomous responses in unpredictable service encounters. In this context, the mechanism for inducing and supporting organizational members' behavior has been repeatedly raised in the operations of food-service companies. In this process, leadership is discussed as a primary factor influencing these attitudes and behaviors [7].

Recent changes in the organizational environment have raised concerns about the limitations of traditional top-down leadership, leading to a growing interest in humble leadership that values organizational members' perceptions and relationships [8]. Humble leadership is a leadership style that changes how a leader interacts within the organization by acknowledging limitations and openly accepting others' strengths and opinions [9,10]. These attributes promote collaborative problem recognition and responses through interactions with members, rather than leaders unilaterally giving instructions [8,11]. This shift from leader-centric control to a collaborative learning orientation is particularly critical in the food-service industry, where front-line employees often possess more immediate and accurate information regarding service failures than their superiors. This collaborative approach is a core element of Social Sustainability, which emphasizes empowering employees and fostering human dignity within the workplace. Such leadership fosters an environment where members can express their opinions and act without fear of punishment or negative evaluation, a state perceived as psychological safety [12,13]. Where psychological safety has been established, members engage in problem-solving and respond to customer needs, proactively, without fearing the repercussions of mistakes [14]. By alleviating the interpersonal risk inherent in admitting service errors, psychological safety transforms service failures from a source of employee burnout into an opportunity for organizational learning and resilience [15]. However, limited research has comprehensively examined how humble leadership leads to service recovery performance through psychological safety within the food-service companies. Current studies focus on the relationship between leadership and performance, lacking an understanding of the psychological processes operating between them. Furthermore, the existing literature often treats 'sustainability' as a vague external outcome rather than a strategic internal process. This study advances the theoretical framework by integrating the principles of Sustainable Human Resource Management (Sustainable HRM), which views employees as human capital to be preserved and developed rather than consumed. By identifying psychological safety as a 'sustainable psychological resource,' this study explores how organizations can maintain long-term service quality and human well-being even under high-pressure conditions. This perspective suggests that humble leadership contributes to Organizational Resilience by creating a secure climate that allows for continuous learning and adaptation. Therefore, this study aims to examine the effect of humble leadership, as perceived by food-service employees, on psychological safety and service recovery performance and to analyze the mediating effect of psychological safety. Specifically, this study addresses the following research question: How does humble leadership influence service recovery performance through the cultivation of psychological safety as a sustainable resource among food-service employees? Through these investigations, this study aims to clarify the role of leadership and

psychological factors in more detail and to present implications for sustainable human resource management.

2. Theoretical Background

2.1. Humble Leadership

Humility has long been discussed in Eastern and Western philosophical traditions as a virtue for individual moral growth and the cultivation of social relationships [16]. It is defined as an attitude that avoids self-display, respects others, and accepts others' perspectives and values [17]. This concept, in contrast to arrogance or self-centeredness, encompasses self-awareness of one's limitations, acknowledgment of others' contributions, and the ability to view oneself within a broader value system [18]. While traditionally viewed as an internal reflective trait, humility in an organizational context transcends individual virtue and manifests as a specific interpersonal leadership style characterized by an openness to learning and collaboration.

Research on traditional leadership has mainly focused on a leader's competence and ability to drive members' performance within the organization. In contrast, humble leadership prioritizes an interactional process where leaders acknowledge their limitations and errors while valuing members' opinions and contributions [8]. From the perspective of Sustainable HRM, humble leadership is a "socially sustainable" leadership style that prioritizes the long-term development of human capital over short-term performance pressure. In contrast, humble leadership focuses on an interaction process where leaders acknowledge their limitations and errors and accept members' opinions and contributions [8]. Rather than exaggerating themselves, humble leaders acknowledge others' strengths and adopt an attitude of learning from members [9]. In the unpredictable environment of food-service operations, this interactional style functions as a critical mechanism for "bottom-up" information flow, allowing leaders to capture field-level insights that are often missed in traditional hierarchical structures. This approach aligns with "regenerative leadership," where leaders foster an environment that restores and builds employee resources rather than merely depleting them for immediate service output. This attitude changes the leader–member relationship and appears to affect members' presentation of opinions and participation in the problem-solving process [9,19].

Humble leadership consists of three dimensions: self-awareness, respect for others, and learning orientation [9,20]. First, self-awareness refers to an attitude to accurately understand one's own abilities and limitations [9]. Leaders with high self-awareness recognize that their judgment or knowledge is incomplete and tend to supplement it with feedback from members [9]. These characteristics mitigate overconfidence in decision-making and reduce the likelihood of flawed judgment [9,17,21]. Second, respect for others entails an attitude that recognizes and appreciates a member's strengths and contributions [9]. Leaders with high respect for others do not attribute their members' performance to individual contributions, but instead emphasize and reveal the contributions of the organizational members. Moreover, rather than unilaterally holding themselves accountable for mistakes or failures, they tend to view them as part of the learning process [9]. This attitude promotes member participation and shifts organizational interaction from leader-centered to member-centered [9,22,23]. Third, learning orientation refers to an attitude of accepting new knowledge and experiences and changing oneself through them [9]. Leaders with this orientation reflect on feedback rather than treating their own judgment as absolute [9]. This learning orientation is the bedrock of sustainable service management, as it ensures that the organization continuously evolves by internalizing the lessons learned from every service failure incident. This promotes information sharing and interaction among members and fosters an environment in which various perspectives can be used within the organization.

This process allows various approaches to be tested in problem-solving situations and contributes to increasing the likelihood of organizational learning and change [9].

2.2. Psychological Safety

Psychological safety, a concept that has long been discussed in organizational behavior research, refers to a state in which members of an organization perceive that taking interpersonal risks by expressing their thoughts, emotions, questions, concerns, or mistakes will not result in negative consequences [24,25], such as criticism, punishment, or reputational damage. In other words, psychological safety exists when members do not view expressing disagreement or admitting mistakes as a threat [25,26]. Accordingly, psychological safety is understood as a collective perception shaped by organizational interactions rather than an individual's intrinsic trait. Factors such as leadership behavior, group norms, and organizational culture influence these perceptions, leading to varying levels of psychological safety [25,26]. Within high-contact service settings, psychological safety acts as a 'buffer' that protects employees from the fear of reprimand when reporting service errors, thereby enabling the immediate transparency required for effective recovery. This contextual character is demonstrated by the fact that the level of psychological safety varies with the characteristics of a team or group, even within the same organization [25,27,28].

Psychological safety does not directly correspond to an individual's personality; rather, it is closely related to how members interact within a specific environment. In a psychologically safe environment, introverted members also express their opinions relatively freely, whereas in a threat-dominated environment, even extroverted members may avoid speaking up [12,29,30]. These distinctions suggest that psychological safety is influenced by perceptions of the organizational environment rather than by individual characteristics [31,32]. Furthermore, psychological safety remains distinct from other psychological constructs. While Psychological empowerment and work commitment are characterized by an individual's internal motivation and state of commitment to task performance, psychological safety focuses on the perception of how others will respond to one's behavior [33,34]. Thus, while empowerment and commitment are rooted in task-related experiences, psychological safety reflects the perceived quality of interpersonal interactions within the organization [34].

Conversely, trust is defined as a willingness to accept situations influenced by others' behavior and is closely related to interpersonal risk, similar to psychological safety [12]. However, there is a difference: trust encompasses the overall relationship between oneself and others, whereas psychological safety focuses more on an individual's perception of others' reactions [34]. This distinction underscores the importance of treating psychological safety as a unique, independent construct when explaining organizational behavior.

2.3. Service Recovery Performance

Service failure is defined as an error in the service process that fails to meet customer expectations or demands in the food-service industry, which is a phenomenon difficult to completely avoid due to the nature of the service [35,36]. These failures are perceived as unexpected risks by customers, consequently, failing to provide an appropriate response to complaints often leads to relationship deterioration and customer churn [37]. Conversely, customer reactions may vary depending on how they are handled during service failure, and effective responses may lead to positive word of mouth, repurchase intentions, and long-term relationship maintenance [38].

Food-service companies aim for flawless service; however, there is a limit to eliminating errors in the operation process due to the nature of the service being consumed simultaneously with production [39]. Service failure is not only a simple disagreement

over expectations but is also magnified by inadequate recovery processes or a lack of response capabilities among staff [39,40]. In this respect, the response following a service failure can be understood as a process of reconstructing the customer experience, not just a follow-up measure. Therefore, service recovery performance should be viewed as a critical indicator of 'operational sustainability.' An organization that excels in recovery can maintain its customer base even amidst inevitable errors, ensuring long-term viability in a saturated market.

Service recovery performance refers to the actions a service provider takes to respond to service failure [39,41] and is understood as a series of processes aimed at restoring customer satisfaction. Examples of these recovery activities include apology, explanation, exchange, compensation, or communication [42], and their methods and levels may vary depending on the job competency and response attitude of hospitality members [43]. Therefore, service recovery can be viewed as a behavioral process emerging through customer interaction rather than a standardized procedure. In food-service companies, service recovery performance provides an opportunity to alleviate customer dissatisfaction and negative experiences and maintain customer relationships [44,45]. Effective post-error responses have been shown to positively influence customer loyalty [46,47], corporate image [48], and positive word-of-mouth [1]. In addition, the service recovery process mitigates customer churn, showing that even in the same failure situation, outcomes may vary depending on the recovery method [49].

Service recovery performance is shaped by the actions and attitudes of members of the contact point organization, where customers tend to evaluate the appropriateness of recovery based on these factors [50]. Specifically, response speed, problem-solving approach, and attitude during interaction influence customer satisfaction. In this regard, frontline members play a pivotal role in fostering customer satisfaction and securing long-term relationships that transcend simple service provision [51]. Even following a service failure, recovery is guided by the response of members of the field organization, and in some cases, the relationship can be stronger than before [49].

2.4. Correlation Among Variables

Humble leadership promotes members' problem-solving behavior through psychological safety, which can lead to service recovery performance [3,7,13]. This shows that leadership influences members' psychological state and behavior, rather than directly producing results, with humility, leadership, and psychological safety as critical process variables in service recovery performance. Humble leadership, characterized by acknowledging their limitations, respecting members' contributions, and demonstrating a learning-oriented attitude [12,13,52], increases openness in interactions with members and forms an atmosphere in which errors are accepted as part of learning rather than as objects of criticism, alleviating the fear of negative consequences when speaking up. Consequently, even if members take interpersonal risks, there is a high likelihood that a state of not being concerned about negative consequences will form [12,52]. Considering these points, humble leadership can be seen as a prerequisite for forming a sense of psychological safety. Therefore, the following hypothesis was established.

Hypothesis 1. *Humble leadership has a positive effect on psychological safety.*

In organizations where psychological safety has been established, it is easier for members to take interpersonal risks, express opinions, or try new approaches [12,52,53]. Proactive behaviors, such as "voice," error reporting, and collective learning, emerge naturally, encouraging staff to intervene in service processes without fear of punitive evaluation [53,54]. In the service organization context, these behaviors are directly linked

to how they respond to service failures. When customer complaints or service errors occur, the organizational members effectively respond to, rather than avoid, the situation, a determining factor of the quality of service recovery [3,7]. These active problem-solving and flexible responses enable meeting customer needs, leading to improved service recovery performance. Accordingly, the following hypothesis was established.

Hypothesis 2. *Psychological safety has a positive effect on service recovery performance.*

Humble leadership not only operates indirectly through psychological safety but can also directly influence members' behavior within the organization. It interacts by accepting members' opinions and encouraging participation, creating conditions for members to respond more actively and flexibly to service failure situations [7,13], rather than suppressing members' problem-solving behavior based on their own judgment. These characteristics, coupled with the rapid decision-making and customer-centered responses required in the service recovery process, enhance service recovery performance [3]. Accordingly, the following hypothesis was established.

Hypothesis 3. *Humble leadership has a positive effect on service recovery performance.*

As discussed above, humble leadership both directly and indirectly affects service recovery performance by fostering a sense of psychological safety through changing the organizational interaction. Specifically, in a service failure situation, members' judgments and actions shape performance, and these behaviors may vary depending on how they perceive the organizational environment. In such an environment, members actively solve their problems instead of avoiding them, enhancing service recovery performance [3,7,12]. Therefore, the following hypothesis was established.

Hypothesis 4. *Humble leadership has a positive effect on service recovery performance through psychological safety.*

As shown in Figure 1, this study investigated the relationship between humble leadership, psychological safety, and service recovery performance.

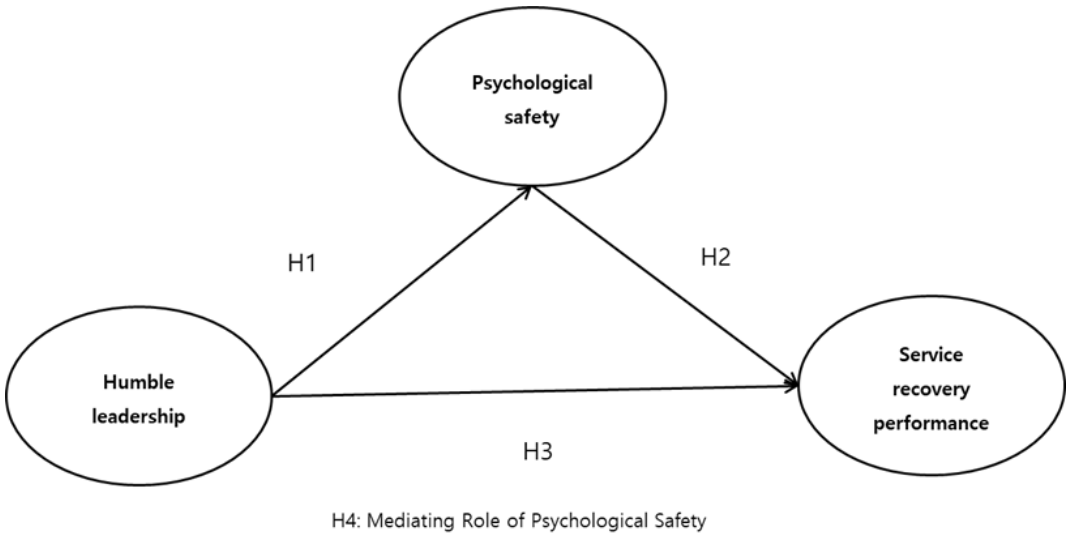


Figure 1. Study model.

3. Materials and Methods

3.1. Data Collection and Method

Data for this study were gathered through an online survey of employees working in food-service companies in Korea from 1 July 2025 to 14 August 2025. Snowball sampling, a nonprobability sampling method, was employed. To initiate the sampling process, we recruited 20 initial "seeds" comprising managers from various sectors—including franchises and full-service restaurants—through professional industry networks. To ensure diverse representation and minimize sampling bias, we included respondents from various establishment types across major regions. The survey was administered anonymously and voluntarily, after obtaining consent, with all respondents being informed of the study's purpose in advance. Ethical review and approval were waived by the Institutional Review Board because the study involved a non-invasive, anonymous survey with minimal risk to adult participants, in accordance with Article 13 of the Enforcement Rule of the Bioethics and Safety Act and Article 22 of the Personal Information Protection Act in Korea. Out of 339 questionnaires collected, only 325 were ultimately used for empirical analysis, excluding the 14 due to incompleteness or low reliability. To ensure the statistical robustness of our findings, we determined the required sample size using a power analysis (G*Power 3.1). Based on an effect size of 0.15 and a significance level of 0.05, the analysis indicated that at least 68 participants were needed to achieve 0.80 statistical power. Our final sample size of 325 significantly exceeds this requirement, providing substantial power to test the hypothesized relationships and effectively minimizing the potential for Type II errors. Data analysis was performed using SPSS 30.0 and AMOS 30.0. A frequency analysis was first conducted to understand the demographic characteristics of respondents (gender, age, educational background, etc.) and then the following two-step analysis procedure (two-step approach): (1) the confirmatory factor analysis to verify the reliability and validity of the measurement model and (2) the structural equation modeling to examine the structural relationships among variables and verify the research hypothesis.

3.2. Measurement

The measurement tools used in this study were adapted from established research on humble leadership, psychological safety, and service recovery performance. Each variable was measured using scales whose reliability and validity have been established in previous studies and was translated and modified to suit the research context. All items were measured on a 5-point Likert scale (1 = disagree at all, 5 = strongly agree).

First, humble leadership is defined as a leader's ability to acknowledge their limitations, respect members' contributions, and demonstrate a learning-oriented attitude, which was measured using Owens et al.'s [9] four-item scale. Next, psychological safety is defined as the extent to which organizational members perceive that they can express their opinions and take interpersonal risks without fear of negative consequences. This study used Edmondson's [25] five-item scale. The scale assesses the expression of opinions, risk-taking, and perceptions of team interaction, and some questions were reverse-scored. Reverse questions were reverse-coded in the analysis. Finally, service recovery performance refers to how the members resolve customer complaints and take appropriate responses in a service failure situation. Here, the measure consisted of four items based on the Boshoff and Allen [49] scale, which captures the speed, effectiveness, expertise, and problem-solving behavior of customer complaint response. For the full list of measurement items, please refer to Appendix A.

4. Results

4.1. Demographics of the Participants

Table 1 summarizes the characteristics of the study sample: 33.2% males and 66.8% females; 40.0% were in their 20s, and 60.3% graduated from junior colleges. Regarding experience, 41.2% had <5 years, and job positions were back of the house in 24.6% and front of the house in 75.4% of participants.

Table 1. Demographic factors of the participants.

Demographic Factors	Category	Number of Participants	Percentage (%)
Gender	Male	108	33.2
	Female	217	66.8
Age	20s	130	40.0
	30s	127	39.1
	40 years and older	68	20.9
Education	High school diploma or less	21	6.5
	Associate degree	196	60.3
	Bachelor's degree (4-year university)	87	26.8
	Graduate degree or higher	21	6.5
Working period	<5 years	134	41.2
	6–10 years	81	24.9
	11–16 years	56	17.2
	15–20 years	43	13.2
	≥20 years	11	3.4
Job position	Back of house	80	24.6
	Front of house	245	75.4
	Total	325	100

4.2. Analysis of the Reliability and Validity

4.2.1. CFA

In this study, CFA was performed to verify the structural validity of the proposed measurement model, and the results are presented in Table 2. The overall model fit satisfies the recommended criteria: χ^2 = 114.291 (df = 62, p < 0.001), minimum discrepancy function/degrees of freedom (CMIN/DF) = 2.327, root mean square residual (RMR) = 0.019, goodness-of-fit index (GFI) = 0.934, adjusted goodness-of-fit index (AGFI) = 0.903, normed fit index (NFI) = 0.946, incremental fit index (IFI) = 0.969, Tucker–Lewis index (TLI) = 0.960, comparative fit index (CFI) = 0.968, and root mean square error of approximation (RMSEA) = 0.064. In particular, CMIN/DF is <3, CFI, TLI, and IFI are >0.90, and RMSEA is <0.08, indicating an acceptable measurement model [55]. In addition, all standardized factor loadings were ≥0.5 and statistically significant (p < 0.001). Conceptual reliability (CR) also met the ≥0.7 criterion, and average variance extracted (AVE) was >0.5, supporting convergent validity [55].

4.2.2. Discriminant Validity

Discriminant validity was verified using Fornell and Larcker's criteria [56]. Specifically, when the AVE value of each constituent concept is higher than the square value of the correlation coefficient between the constituent concepts, discriminant validity is established. The analysis results are presented in Table 3. Verifying the relationship between psychological safety and service recovery performance, which showed the highest correlation among the variables, yielded a correlation coefficient of 0.748 and a squared value of 0.559. Conversely, the AVE of psychological safety and service recovery performance

was 0.748 and 0.761, respectively, both of which are larger than the square of the correlation coefficient (0.559). In addition, the AVE value (0.766) for humble leadership was higher than the square of the correlation coefficients with other constituent concepts. Therefore, in all constituent concepts, the AVE exceeds the squared correlation coefficients, indicating that the measurement items demonstrate secured discriminant validity [56].

Table 2. Confirmatory factor analysis.

Factor and Variable		Standardized Loading	S.E	C.R	AVE	Composite Construction Reliability (CCR)	Cronbach's α
Humble leadership	HL1	0.784	-	-	0.766	0.929	0.882
	HL2	0.825	0.075	15.661 ***			
	HL3	0.842	0.068	16.008 ***			
	HL4	0.780	0.074	14.662 ***			
Psychological safety	PS1	0.836	-	-	0.748	0.937	0.886
	PS2	0.776	0.062	15.916 ***			
	PS3	0.748	0.070	15.124 ***			
	PS4	0.757	0.060	15.375 ***			
	PS5	0.794	0.058	16.447 ***			
Service recovery performance	SRP1	0.804	-	-	0.761	0.927	0.871
	SRP2	0.877	0.064	17.535 ***			
	SRP3	0.806	0.051	15.871 ***			
	SRP4	0.713	0.078	13.605 ***			
χ^2 = 114.291 (df = 62, $p < 0.001$), CMIN/DF = 2.327, RMR = 0.019, GFI = 0.934, AGFI = 0.903, NFI = 0.946, IFI = 0.969, TLI = 0.960, CFI = 0.968, and RMSEA = 0.064							

*** $p < 0.001$.

Table 3. Discriminant validity of the variables.

Factor	Humble Leadership	Psychological Safety	Service Recovery Performance
Humble leadership	**0.766** (1)	0.467 (3)	0.356
Psychological safety	0.684 (2)	**0.748**	0.559
Service recovery performance	0.597	0.748	**0.761**
Mean	3.98	3.93	4.05
S.D.	0.652	0.604	0.630

$p < 0.01$; Diagonal: (1) Average Variance Extracted; Area below the diagonal: (2) The correlation coefficient for the constructs (r); (3) Area above the diagonal: The square of the correlation coefficient (r^2).

4.2.3. Common Method Bias

To address potential common method bias (CMB), we performed Harman's single-factor analysis. The results indicated that the primary factor accounted for 42.93% of the variance, falling safely below the recommended 50% benchmark [57]. This suggests that CMB does not pose a substantial threat to our findings. Additionally, we assessed multicollinearity through Variance Inflation Factors (VIF). All VIF values were strictly under 3.3, confirming the robustness of our data against common method concerns [58].

4.3. Hypothesis Testing

In this study, structural equation modeling using AMOS 30.0 supported the proposed hypothesis. The analysis revealed that model fit indices were acceptable and met the recommended criteria: χ^2 = 114.291 (df = 62, $p < 0.001$), CMIN/DF = 2.327, RMR = 0.019,

GFI = 0.934, AGFI = 0.903, NFI = 0.946, IFI = 0.960, TLI = 0.960, CFI = 0.968, and RMSEA = 0.064. In particular, CFI, TLI, and IFI were >0.90, and RMSEA was <0.08, indicating a good model fit [55].

The hypothesis testing results are presented in Table 4 and Figure 2. First, it was adopted as showing a statistically significant positive (+) effect: "Humble leadership will have a positive (+) effect on psychological safety," as suggested in Hypothesis 1 (β = 0.684; $p < 0.001$). Hypothesis 2, "Psychological safety will have a positive (+) effect on service recovery performance," was also supported, confirming a significant positive (+) relationship (β = 0.638, $p < 0.001$). Hypothesis 3, "Humble Leadership will have a positive (+) effect on service recovery performance," was also significant and supported (β = 0.160, $p < 0.05$), indicating that humble leadership directly affects service recovery performance. The bootstrapping method to test Hypothesis 4 revealed a significant effect of humble leadership on service recovery performance through psychological safety (β = 0.437, $p < 0.01$; 95% Bias-corrected CI [0.316, 0.602]). These results indicate partial mediation in the relationship between the two variables. Both direct and indirect effects of humble leadership were significant. Notably, an interpretive comparison of the effect sizes reveals that the indirect effect of humble leadership through psychological safety is substantially larger than its direct effect on service recovery performance. This disparity indicates that while humble leadership provides a foundational orientation, its substantive impact on service recovery performance is primarily realized when it successfully fosters a psychologically safe environment. In other words, psychological safety functions as the primary driver that amplifies the influence of leader humility, translating a leader's relational attitude into actual service recovery outcomes.

Table 4. Results of the structural equation model analysis.

	Process (Hypotheses)	Estimate	*t*-Value	*p*-Value	Indirect Effect		Decision
					Estimate	*p*	
H1	Humble leadership → Psychological safety	0.684	10.944 ***	0.000			Accepted
H2	Psychological safety → Service recovery performance	0.638	8.291 ***	0.000			Accepted
H3	Humble leadership → Service recovery performance	0.160	2.295 *	0.022			Accepted
H4	Humble leadership → Service recovery performance (indirect effects of Psychological safety)	0.160	2.295 *	0.022	0.437 **	0.004	Accepted

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

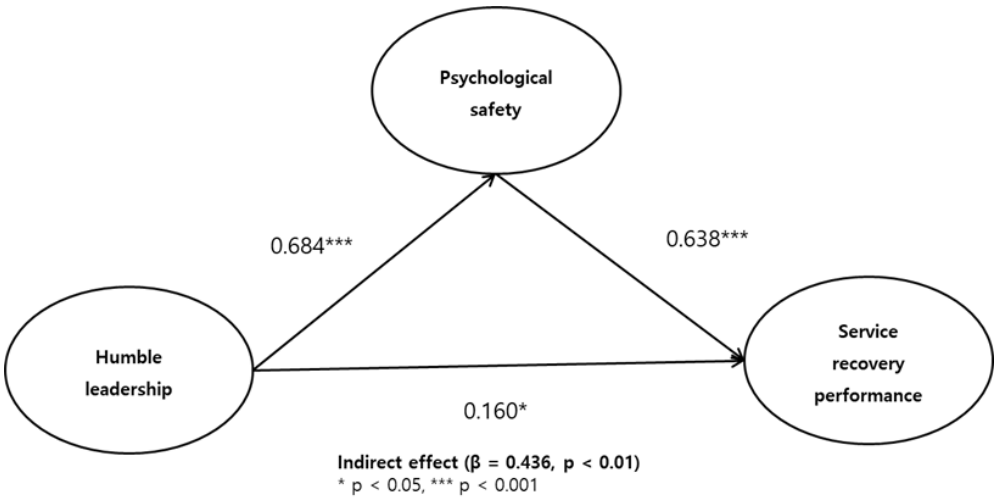


Figure 2. Structural equation model analysis results.

5. Discussion

This study empirically analyzed the structural relationships among humble leadership, psychological safety, and service recovery performance within the high-pressure environment of food-service operations. The findings confirm that humble leadership serves as a foundational driver for psychological safety, which in turn acts as the primary catalyst for effective service recovery. Moving beyond mere statistical confirmation, these results offer several critical interpretations regarding sustainable service management. The analysis revealed that humble leadership significantly affects psychological safety. This suggests that a humble leader who acknowledges limitations, accepts the opinions and contributions of members, and emphasizes learning and cooperation fosters more open interactions. Unlike traditional top-down approaches, humble leadership establishes structural conditions that reduce the psychological cost for employees when voicing concerns or admitting errors. This interactional shift aligns with the core principles of Social Sustainability, which prioritize human dignity and the empowerment of frontline staff by transforming hierarchical control into collaborative support. This suggests that humble leadership serves as a strategic "bottom-up" resource in food-service management, where leaders leverage front-line insights to build a resilient organizational climate that values transparency over rigid hierarchy. While prior research has established a link between humble leadership and general performance, this study provides an incremental contribution by identifying how this leadership style functions within the high-pressure, simultaneous production-consumption environment of restaurants. Unlike traditional office settings, frontline restaurant employees often hold more immediate and nuanced information regarding service failures than their supervisors; thus, a leader's humility becomes a critical "informational catalyst" that allows this bottom-up data to be utilized for real-time problem solving. In addition, psychological safety was found to have a significant effect on service recovery performance. This suggests that, for members' active responses to translate into performance, rather than avoidance, in a service failure situation, an environment where they can act without fear of failure must be established. Particularly, in an environment with many customer contact points, such as a food-service company, where immediate judgment and flexible responses are required in each situation, psychological safety encourages members to be actively involved in the problem-solving process to meet customer needs. From a sustainability perspective, this finding indicates that psychological safety is not merely a transient feeling but a sustainable psychological asset that prevents emotional exhaustion and ensures consistent service quality even during repeated service encounters. By preserving the psychological well-being of employees, psychological safety functions as a critical mechanism of Sustainable Human Resource Management (Sustainable HRM), which views human capital as a resource to be developed and sustained rather than depleted through intense emotional labor. This result distinguishes itself from broader organizational studies by emphasizing that in the hospitality sector, psychological safety specifically mitigates the "interpersonal risk" associated with direct customer confrontation. It transforms the employee's fear of blame into a proactive engagement with the guest, thereby securing social capital (customer trust) even amidst service errors [3,7]. Humble leadership was also found to significantly enhance service recovery performance, suggesting that humble leaders who encourage autonomy and participation enable participation in service failure situations. In this way, humble leadership provides a behavioral basis for members to participate proactively in the problem-solving process, leading to improved service recovery performance. This underscores the analytical shift from "command-and-control" to "empowerment-based" leadership, which is essential for managing the dynamic and often unpredictable failures inherent in restaurant operations. This aligns with previous studies

highlighting that leadership in a service environment may facilitate performance through members' actions [7,13].

Finally, psychological safety was found to mediate the relationship between humble leadership and service recovery performance. Rather than directly improving performance, humble leadership operates through an indirect mechanism that shapes members' psychological state, which in turn drives behavior. In particular, in service failure situations, members' perception of the organizational environment greatly influences their responses. When psychological safety is fostered, members perceive failure as an opportunity for learning and problem-solving rather than avoidance, increasing the likelihood of more active response behavior. An interpretive analysis of the effect sizes provides a more nuanced understanding of this relationship: the indirect effect mediated by psychological safety is larger than the direct effect of humble leadership on service recovery performance. This marked difference in magnitude reinforces the substantive value of the mediation result over its mere statistical significance. It suggests that in the high-contact food-service industry, a leader's humility alone has a limited direct impact unless it is successfully channeled into building a secure interpersonal climate. Thus, the effectiveness of humble leadership is primarily realized through its capacity to amplify psychological safety, which serves as the dominant catalyst for proactive service recovery behavior. This indirect pathway reveals the "sustainability loop": humble leadership tends to foster psychological safety, which can help reframe service failures into learning cycles, thereby enhancing the long-term operational resilience of the company. This loop constitutes a theorized advancement in sustainable service management, demonstrating how leadership-driven psychological assets provide the necessary "regenerative" capacity for organizations to thrive amidst inevitable operational challenges. These results extend existing studies by emphasizing the combined action of leadership and psychological factors, where humble leadership influences service recovery performance through psychological safety [3,7,13].

Taken together, this study demonstrates that in an industry where service failures are inevitable, the core mechanism for recovery is shaped not by isolated competencies, but by the psychological conditions fostered by leadership. By empirically testing this model in the specific context of restaurant service recovery, this study offers fresh evidence that leadership-performance links are deeply contingent upon the industry's operational simultaneity and the psychological security of frontline responders. This study advances the theoretical novelty by articulating how a leader's "expressed humility" becomes an operational catalyst for sustainable service management, ensuring that both human capital and customer relationships are maintained through a psychologically secure work environment. Therefore, this study contributes theoretically by offering an integrated explanatory framework that links leadership, psychology, action, and performance in food-service contexts.

6. Implications

6.1. Academic Implication

The academic implications of this study can be summarized as follows. First, this study empirically investigated how humble leadership influences service recovery performance through psychological safety in food-service organizations, presenting an integrated structure linking leadership and psychological performance. Existing leadership research has largely focused on the formation of relationships between leaders and members or attitudinal variables. However, this study provides a theoretical expansion by explaining how leadership reshapes the interaction structures within the organization, thereby influencing behavior and performance through members' psychological states. In particular, by specifying psychological safety as a key mechanism, it empirically shows that the leadership

effect works as a process of forming a cognitive structure within the organization beyond the simple influence exercise [12,52]. By verifying this model in food-service companies, where service failures frequently occur, this study broadens the scope of application of leadership research to service operations.

Second, by confirming that psychological safety mediates the relationship between humble leadership and service recovery performance, this study extends its role from general organizational behavior to service recovery. Previous studies have focused on the relationships among behavioral variables within the organization, such as speech behavior and participatory behavior [53,54]. In contrast, this study illustrates that psychological mechanisms are directly associated with actual response behaviors and performance outcomes during real-world service failures. It highlights that organizational members' willingness to take interpersonal risks and engage in the problem-solving process translates into performance beyond a simple attitude level, supporting a more behavior- and outcome-oriented perspective of psychological safety [7].

Third, this study clarifies the explanatory structure of the relationship between leadership and performance by simultaneously examining the direct and indirect effects of humble leadership on service recovery performance via psychological safety. While existing studies tended to emphasize direct effects of leadership on performance, this study highlights the leadership mechanism by considering the psychological processes that operate in between. Specifically, humble leadership exhibits both direct and indirect associations with performance and indirectly through psychological safety, indicating a multilayered mechanism rather than a single path. These findings highlight the theoretical significance of psychological conditions as key mediators linking leadership to performance in high-contact service environments [3]. Fourth, this study explains the mechanism of creating performance in a more realistic operating environment using the service failure situation of food-service companies as the analytical context. Unlike existing studies in relatively general organizational contexts, this study examines leadership and psychological safety under repetitive and highly uncertain service failure situations. It redefines service failure as an operating environment that must be managed continuously, not a simple exceptional event, and theoretically identifies key factors that induce members' behavior in this situation. Furthermore, this study advances the theoretical link between leadership and "social sustainability" by identifying customer trust as a form of social capital resource. In this framework, effective service recovery—facilitated by humble leadership and psychological safety—does not merely resolve a single complaint; it restores and strengthens the long-term bond between the firm and its stakeholders. This perspective reframes service recovery as a sustainable management practice that minimizes "relational waste"—the loss of customer trust and brand equity that occurs when service failures are poorly handled—thereby offering a more robust basis for expanding the discussion of organizational stability and long-term economic viability.

6.2. Practical Implication

The practical implications of this study are as follows. First, food-service managers should recognize that humble leadership is a vital tool for social sustainability. By acknowledging their own limitations, managers can reduce the psychological strain on staff, preventing "emotional erosion" and supporting "long-term employee retention" in an industry known for high turnover. Since the mediated effect through psychological safety was substantially larger than the direct effect, managers should prioritize creating a safe climate over merely adopting a humble posture. Therefore, managers must consistently acknowledge limitations and accept members' opinions and feedback, supported by leadership education or feedback-based coaching programs. In a service failure situation, the man-

ager's public acknowledgment of the problem and sharing the direction of improvement can reduce member contraction and encourage participation in problem-solving [12,52].

Second, organizations should implement practical systems that systematically support a sense of psychological safety. Beyond simple slogans, creating an environment where members can respond to failures without avoiding problems minimizes "service waste," such as wasted ingredients and managerial time, contributing to economic sustainability. To this end, a structure in which mistake reporting and improvement proposals can actually be made should be established. For example, it is required to operate a conference body that regularly shares service failure cases, provides positive feedback on improvement behaviors, and establishes a case-based learning system. These systems can transform members to perceive failure as an opportunity for learning rather than punishment, enhancing the consistency and quality of response in the service recovery process [3,7].

Third, food-service companies should balance authority delegation and decision-making criteria by reflecting the speed and flexibility required in the recovery process. In an environment where psychological safety is ensured, members are more likely to act quickly rather than delay active situational judgment. Therefore, empowering field staff to respond autonomously to customer complaints within a defined boundary while clearly presenting judgment criteria enhances responsiveness and reduces volatility in service recovery performance [3,7]. This empowerment builds "social capital," transforming negative encounters into long-term relational assets and ensuring the social and economic viability of the service brand.

Fourth, regarding the personnel and evaluation system, criteria that recognize members' problem-solving behavior and participation should be established. This study shows that when psychological safety is established, members participate more actively in problem-solving, leading to better outcomes. Therefore, behaviors such as raising problems and cooperative communication should be included as key evaluation factors. Building a case database or linking it with educational programs allows service failure experiences to be used as accumulated learning resources. This approach effectively "reduces employee burnout" by shifting the focus from individual culpability to collective growth, creating a psychologically sustainable workplace where workers feel valued as long-term partners. This transforms behavior into a long-term capacity-building process and promotes the organization's operational stability.

Taken together, humble leadership and psychological safety serve as key strategies for managing failure in a food-service environment where such failures are unavoidable. They enable consistent responses and learning beyond short-term problem-solving, ultimately maintaining service quality and securing customer relationship continuity.

6.3. Limitations and Future Research

This study empirically identified the relationship among humble leadership, psychological safety, and service recovery performance; however, several limitations remain, and future research directions are suggested.

First, the generalizability of the findings is limited, as the collected and analyzed data were drawn from members of domestic food-service companies. Furthermore, the use of snowball sampling, a non-probability sampling method, may further limit the representativeness of the sample. As the food-service industry is highly contact-intensive, where production and consumption occur simultaneously, customer expectations, service interaction methods, and organizational structures may differ across industries and countries. These contextual differences may influence the strength and operation of the process and, in turn, service recovery performance by fostering a sense of psychological safety through humbling leadership. Therefore, future research should extend beyond

food-service companies to include various service industries, such as hotels, airlines, and travel agencies, and conduct cross-country and cross-cultural comparisons. In particular, if the effect of humble leadership is universal or depends on specific contexts, as revealed in multi-group analysis, the external validity of the leadership-performance relationship can be more robustly established. Second, this study explained service recovery performance through humble leadership and psychological safety, but did not sufficiently account for situational and organizational factors in the actual service recovery process. Service failure is a complex, contextual factor shaped by customer responses, the level of cooperation within the team, the decision-making structure, and the degree of delegation of authority operate simultaneously. In addition, in the current service environment, the use of digital technology and information-sharing methods can also influence members' response behavior. Therefore, future research should develop an integrated research model that includes organizational culture, team structure, customer characteristics, and technology use level, and examine whether these variables strengthen or weaken the relationship between humble leadership and psychological safety. This will enable a more realistic and multidimensional perspective. Third, this study is limited in reflecting causal relationships or temporal changes, as it relies on cross-sectional data collected at a single point in time. The service recovery process is not an action completed at a single point in time but a dynamic process accumulated through repeated experiences and learning. Humility, leadership, and psychological safety can also change and be strengthened over time. Therefore, while the structural relationships were statistically significant, the results should be interpreted as associative findings rather than definitive evidence of causality. Therefore, future studies should adopt a longitudinal or time-lagged design. Fourth, this study is limited by its reliance on self-reported recognition data, which may not accurately capture actual behavior or objective performance and may introduce common method bias. In particular, given that service recovery performance is often evaluated through customer evaluations or actual service outcomes, future research should use multi-source data, combining customer evaluations, manager evaluations, and organizational objective performance indicators. Specifically, future studies could incorporate objective performance indicators—such as internal customer complaint records or professional mystery shopper ratings—to triangulate employee self-reports. Furthermore, integrating customer-side perspectives on service recovery would allow for a more robust verification of whether the psychological safety felt by employees truly translates into perceived service quality and long-term customer trust. Through this, the relationship between members' perceptions and actual service outcomes can be verified in a more three-dimensional way, and the validity of the research results can be strengthened.

7. Conclusions

This study highlights psychological safety as the bridge connecting humble leadership to service recovery performance. Our findings reveal that the impact of leader humility is most potent when it fosters a work environment in which employees are unafraid to take risks or learn from mistakes. Given the demanding and often unforgiving nature of food service work, humility alone is insufficient. Leaders must actively champion a culture of safety to ensure that service recovery is not just a goal, but a consistent performance outcome.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

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Appendix A

Table A1. Measurement items.

	Measurement Items
Humble leadership	Our leader actively seeks feedback even when it is critical content. Our leader honestly admits to their mistake. Our leader expresses gratitude for our members' contribution. Our leader demonstrates willingness to learn from others.
Psychological safety	Mistakes made in this team often leads to negative consequences. (reverse questions) Members of this team feel free to raise problems or difficult issues. Members of this team are sometimes rejected for being different. (reverse questions) Members of this team feel safe taking risks. Members of this team feel easy to ask others for help.
Service recovery performance	I respond quickly when a customer complains about a service problem I effectively solve customer complaints during service failure. I deal with customer complaints professionally. I take appropriate measures when a service failure occurs.

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