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When Abusive Supervision Increases Workplace Deviance: The Moderating Role of Psychological Safety and Organizational Identification

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Abstract: *This study offers new insights into the moderators between abusive supervision and workplace deviance. Building on the conservation-of-resources theory, the study introduces coping resources as moderators between abusive supervision and the two dimensions of workplace deviance, that is, interpersonal and organizational deviance. The study identifies psychological safety, an intrapsychic state, as a moderator between abusive supervision and interpersonal deviance. Similarly, the research tests organizational identification as a moderator between abusive supervision and organizational deviance. The study tests the hypotheses by collecting two-source of data from various Pakistani organizations. The two-source data from 122 supervisor-subordinate dyads provide support for the results. The study finds that low psychological safety strengthens the positive link between abusive supervision and interpersonal deviance. Besides, a low level of identification with an organization strengthens the positive association between abusive supervision and organizational deviance. Thus, the study extends the literature by highlighting the importance of several personal and coping resources for employees at work.*

When Abusive Supervision Increases Workplace Deviance: The Moderating Role of Psychological Safety and Organizational Identification

1. Introduction

Globally, abuse by supervisors causes stress for employees and harmful consequences for organizations (Lin et al., 2013; Raza et al., 2023; Scheuer et al., 2016). In the US, over 13 percent of workers are affected by abusive supervisors. Employees fear going to work, which incurs a cost of $23.8 billion annually to these organizations due to health problems, absenteeism and low productivity (Zhang et al., 2021). Similarly, in Pakistan, 15 percent of the workforce experiences abuse, where men (16 percent) report more vulnerability compared to women (13 percent) (Mehmood et al., 2020). These abusive supervisors cause adverse outcomes for organizations (Mackey et al., 2021). For instance, abusive supervision increases workplace deviance (WD) (Khaleel & Chelliah, 2023), defined as 'voluntary behaviors that violate significant organizational norms and in so doing threaten the well-being of an organization, its members, or both' (Robinson & Bennett, 1995, p. 556). Given the prevalence of deviant behaviors, scholars have provided evidence of how and under what conditions these occur.

Previous research shows distinct approaches to understand the link between abusive supervision and WD. The first approach is a trickle-down effect. The trickle-down effect shows abusive supervisors as role models for lower levels of management, determining similar behaviors among the latter (Bhattacharjee & Sarkar, 2022; Mawritz et al., 2012; Rice et al., 2021). Research has shown that the trickle-down effect transmits negative behaviors among employees, where followers engage in deviant workplace behaviors either towards other less empowered peers (Mawritz et al., 2012; Wang et al., 2015) or towards the organization (Tepper et al., 2009; Vogel & Mitchell, 2017). Conversely, the victimization approach argues that abusive supervision is subject to subordinate characteristics (Mawritz et al., 2017; Shillamkwese et al., 2020). More prominently, subordinates act as deviant actors when their supervisors are abusive (Lian et al., 2012; Tepper et al., 2009).

Although the adverse consequences associated with abusive supervision have been extensively researched, the moderating mechanisms that can mitigate or instigate a subordinate's potential as a

deviant actor still need to be addressed (Lian et al., 2012; Mackey et al., 2017; Tepper et al., 2009). Previously, scholars have focused on negative reciprocity (Mitchell & Ambrose, 2007), norms of organizational deviance (Tepper et al., 2008), traditional values (Liu et al., 2010), management styles (Thau et al., 2009), intentions to quit (Tepper et al., 2009), justice perceptions and individual differences (Mackey et al., 2017) as moderators. The present study utilizes resources as moderators between abusive supervision and WD.

Using conservation-of-resources (COR) theory (Hobfoll, 1989, 2001), the research argues that abusive supervision is perceived as stress, which leads to the return of mistreatment toward peers or deviation from organizational norms. This occurs because employees are involved in interpersonal deviance (ID) or organizational deviance (OD) as a tool to limit the stress caused by abusive leaders (Mitchell & Ambrose, 2007). These dimensions are interdependent and can be studied separately (Berry et al., 2007) to explore how ID and OD arise differently from the same predictor (Diefendorff & Mehta, 2007). Thus, this study examines how abusive supervision leads to varying levels of ID and OD.

COR theory emphasizes that certain resources may influence individuals' ability to restore the resources they have lost in stressful circumstances, such as when dealing with abusive supervisors (Bhattacharjee & Sarkar, 2022). The study proposes two resources, that is, psychological safety and organizational identification, as boundary conditions impacting employees' tendency to be involved in ID and OD when facing abusive supervisors. Based on the resource investment principle of COR theory (Hobfoll, 2001), individuals invest "resources in order to protect against resource loss, recover from losses, and gain resources" (Hobfoll et al., 2018, p.105) Here, psychological safety is salient as it is context-specific and helps deal with potential negative behaviors (Gao et al., 2022). Further, COR theory asserts that employees' validation of involvement is similar to the negative behaviors of their supervisors, which are exacerbated when their evaluation of stressors is inconsistent in dealing with the situation. This study argues that stress resulting from the abusive behavior of a supervisor can be affected by an individual's affiliation with valuable resources (Hobfoll, 1989; Hobfoll et al., 2018). COR theory states that employees' identification with the organization affects their evaluation of a harmful organizational stressor (Hobfoll, 1989), influencing their behavior. This occurs because behavioral outcomes—such as employees venting against the organization—that are dependent on supervisors' behavior are affected by organizational identification. Identification may

either intensify the negative impact or circumvent it, based on the level of identification with the organization (Arshad et al., 2023; Wegge et al., 2012). Following Arshad et al. (2023), organizational identification is taken as the unique personal characteristic influencing the evaluation of stress, in our case, the stress emanating from abusive supervision.

Taken together, this research contributes to the literature on abusive leadership and workplace deviance as follows. First, it separately analyzes the two dimensions of workplace deviance with respect to abusive supervision (Arshad & Malik, 2020). Second, the study offers an understanding of the coping resources (the ability to deal with the effects of abusive supervision) that may intensify or buffer the effects of abusive supervisors on employees' behavior. Thus, the hypothesized model can help identify the involvement of employees in interpersonal and organizational deviance. The employees would likely reciprocate by showing a destructive attitude toward other employees or the organization (Figure 1). The hypothesized model holds substantial exploratory power for other behavioral, psychological and attitudinal consequences connected to interpersonal and organizational deviance.

Figure 1: Hypothesized Model
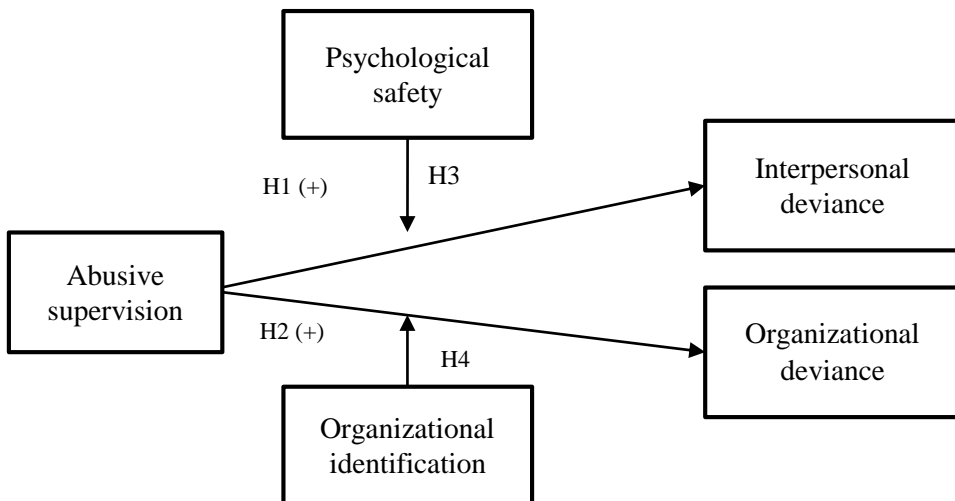
The paper is structured in the following manner. Section 2 explains the development of the hypotheses. Section 3 explains the methodology used for collecting data. Section 4 demonstrates the research findings. Finally, Section 5 discusses the conclusion and limitations of this research.

2. Hypothesis Development

2.1. Abusive Supervision

Abusive supervision refers to subordinates' perception of the hostile display of verbal and nonverbal behaviors by their supervisor, excluding physical mistreatment (Tepper, 2000). This behavior can be characterized as one that ridicules, humiliates, blames or intimidates subordinates (Keashly & Harvey, 2006; Mitchell & Ambrose, 2007). Supervisors with these characteristics dominate their employees (Ashforth, 1997). Leadership styles significantly affect work behaviors (Huertas-Valdivia et al., 2019). The present study highlights abusive supervision as an antecedent of deviant workplace behaviors.

The literature has shown the burgeoning of negative outcomes among employees who experience abusive supervisors (Bhattacharjee & Sarkar, 2022). Previously, the Big Five personality factors, justice variables and several attitudes and perceptions were considered the predominant antecedents of interpersonal deviance (Mackey et al., 2021). Abusive supervision negatively impacts the perception of justice (Tepper, 2000) and leads to emotional states such as frustration, alienation and helplessness (Carlson et al., 2012; Chi & Liang, 2013). Therefore, abusive supervision can be a potential antecedent of interpersonal workplace deviance.

2.2. Workplace Deviance

Several scholars have attempted to categorize deviance in the workplace context (e.g., Mangione & Quinn, 1975; Wheeler, 1976). These endeavors provided a foundation for the development of an integrative framework of deviant behaviors by Robinson and Bennett (1995). The authors have developed a typology by categorizing these behaviors along two dimensions and into four groups. Workplace deviance refers to behaviors violating organizational norms and threaten organizational well-being (Kaplan, 1975). These include (a) property deviance where employees tend to attain or harm the physical assets of their workplace without a sanction from relevant authority, (b) production deviance or 'behaviors that violate the formally prohibited norms delineating the minimal quality and quantity of work to be accomplished' (Hollinger & Clarks, 1982), (c) political deviance or behavior that hinders other individuals privately or politically in social interaction, and (d) in personal aggression, an individual exhibits aggressive behaviors towards other individuals (Robinson & Bennett, 1995). Among these, the first two

groups refer to OD, while the latter two refer to interpersonal forms of deviance. Hence, ID refers to behaviors intended to cause harm to other individuals at work through verbal abuse and sexual harassment, among others. Similarly, OD refers to behaviors intended to harm an organization's interests, such as extending overtime or shirking work (Mitchell & Ambrose, 2007).

2.3. Abusive Supervision and Workplace Deviance

Drawing on the COR theory, abusive supervision is considered an undesirable behavior that causes stress for employees (Hobfoll, 2001). COR theory states that individuals strive to protect, retain and gain the resources they value (Bhattacharjee & Sarkar, 2022). The stress caused by abusive leaders depletes employees' resources and affects their behaviors (Li et al., 2016).

The literature shows the burgeoning of negative perceptions among employees experiencing abusive supervisors. Employees subject to abuse by their supervisors identify the supervisor's behavior as morally wrong (Priesemuth, 2013). Though the abuse may be verbal or nonverbal, the stress perspective suggests that abusive supervision can be identified as an 'interpersonal stressor' that influences employees' reactions (Lin et al., 2013). For instance, physically drained and emotionally exhausted employees conserve their resources in the form of work withdrawal and abuse of their co-workers (Chi & Li, 2013; Wheeler et al., 2013). Among the various reactions, employees' negative reciprocity validates the return of mistreatment (Eisenberger et al., 2004). Thus, the perception of abusive supervision has various negative implications for interpersonal deviance and organizational outcomes (Khaleel & Chelliah, 2023).

At the interpersonal level, employees may displace behaviors directed towards their peers or the organization. For instance, the displacement of aggression that builds up from experiencing an abusive boss, can be expressed by targeting other peers (Mitchell & Ambrose, 2007; Wei & Si, 2013). Such expressions of aggression can be toward the organization as well (Wei & Si, 2013). Employees choose these options because they cannot express their aggression toward their supervisor and thus partake in ID or OD. Thus, the hypothesis states:

Hypothesis 1: Abusive supervision is positively associated with interpersonal deviance.

Hypothesis 2: Abusive supervision is positively associated with organizational deviance.

2.4. *Psychological Safety*

Psychological safety is an 'intrapsychic state related to interpersonal experience' (Edmondson, 2004). Kahn (1999, p. 708) defines the term as "a feeling able to show and employ oneself without fear of negative consequences to self-image, status, or career". It also indicates characteristics of the work climate such as mutual respect, where individuals can express themselves safely. According to Edmondson (1999), psychological safety also comprises beliefs regarding others' responses or putting oneself on the line, such as posing questions, asking for feedback, offering a novel idea, or reporting an error. The concept illustrates the individual's perception of the outcomes of interpersonal risks at their workplace (Gao et al., 2022).

2.5. *Psychological Safety: A Moderator between Abusive Supervision and Interpersonal Deviance*

Psychological safety is an essential element of therapeutic context (Waks, 1988), enabling individuals to achieve their goals, remain focused and anticipate solutions to problems (Edmondson, 1999). Based on its characteristics, psychological safety is a significant psychological variable for evaluating the effects of leadership styles on employees' work behaviors (Gao et al., 2022). Research shows that oppressive and exploitative leadership styles are not conducive to psychological safety perceptions (Huang et al., 2022). Based on the COR theory (Hobfoll, 2001), the characteristics of psychological safety strengthen the self-concept of employees and allow them to deal with stressful work conditions. When the experience of abusive supervision depletes employees' resources, they strive to protect and rebuild the resource loss (Halbesleben et al., 2014; Hobfoll, 2001). A high level of psychological safety, as an energy resource, motivates employees to retain their lost energy.

Given the pattern of interrelationships, this study proposes that psychological safety, as a self-concept, influences the link between abusive supervision and ID. Under high psychological safety, employees can safely express themselves in front of their bosses without fear of negative impact or harm (Frazier et al., 2017). Whereas high psychological safety gives employees the confidence to deal with their surrounding context without fear of harm, low psychological safety makes them

submissive (Zhang et al., 2010). In cases of abusive supervision, individuals feel less psychologically safe because of pressure from their supervisor. When experiencing an abusive boss, individuals may not want to put themselves at risk when they already feel threatened. Therefore, an employee may deviate from norms and, rather than showing mutual respect for others, they may become involved in interpersonal deviance. Thus, the study suggests that for individuals with a low level of psychological safety, the association between abusive supervision and interpersonal deviance will be stronger than for those who possess a high level of psychological safety.

Hypothesis 3: Psychological safety moderates the positive relationship between employees' perception of abusive supervision and their tendency to be involved in interpersonal deviance, such that the relationship will be stronger for low psychological safety.

2.6. Organizational Identification

Organizational identification has been defined as 'a perceived oneness with an organization and the experience of the organization's successes and failures as one's own' (Mael & Ashforth, 1992). Organizational identification is deeply rooted in individuals' perception of the resemblance amongst the self and the organization (Ashforth & Mael, 1989). The elements that signify an organization's attractiveness include reputation or status and individuality (Mael & Ashforth, 1992).

2.7. Organizational Identification as a Moderator between Abusive Supervision and Organizational Deviance

According to the COR theory, the resource loss that results from stress can be affected by an individual's affiliation with valuable resources (Hobfoll, 1989; Hobfoll et al., 2018). Organizational identification influences the response triggered by stressful workplace conditions (Arshad et al., 2023), such as experiencing abusive supervision. When experiencing an abusive supervisor, individuals may either decide to actively cope with their resource restoration or choose to avoid coping with their strain. In either case, the availability of personal characteristics (i.e., organizational identification) plays a key role in selecting appropriate coping mechanisms (Arshad et al., 2023; Wegge et al., 2012). For example, the ability to deal with abusive supervision will be

different under a high level of organizational identification relative to a low level of organizational identification.

As previously defined, organizational identification is the extent to which the members of an organization perceive cohesion and oneness with the organization's success and failure. The more individuals can identify with an organization, the better that organizational interests will be embedded in their self-concept. Therefore, individuals tend to behave in alignment with organizational interest (Ashforth & Mael, 1989; Blader et al., 2017). On the contrary, low levels of organizational identification may negatively impact the relationship between abusive supervisors and organizational-directed behaviors. For instance, when individuals are subjected to abusive supervision in the workplace, this results in negative outcomes (Ashforth & Humphrey, 1993; Decoster et al., 2013). Hence, this study intends to identify the extent to which employees engage in organizational deviance upon experiencing abusive supervision, at various levels of organizational identification at their workplace. I believe that employees with low levels of organizational identification when confronted with an abusive supervisor are more likely to engage in destructive behaviors and deviate from organizational norms.

Hypothesis 4: Organizational identification moderates the positive relationship between abusive supervision and organizational deviance, such that the relationship will be stronger for low organizational identification.

3. Research Methods

3.1. Sample and Procedure

The study participants were full-time employees working in various industries in Pakistan, including banking, e-commerce, fertilizer production, engineering and education. To enhance the generalizability of the results, numerous organizations were chosen (Ostroff, 2007). First, the study provided cover letters to the human resources (HR) department in each case, indicating the study's aim. Upon receiving approval from HR, they were asked to randomly select supervisors working within their different departments. These selected supervisors, along with three to five subordinates, provide the data for our study. The companies were selected based on personal contacts, as this reduces the potential constraints linked to the organization (Rousseau & Fried, 2001). Two-source data, i.e.,

subordinate-supervisor dyads, was used. This criterion was used to reduce potential common method variance (CMV) (Bauer et al., 1998).

Further, two forms were developed to record subordinates' and supervisors' perspectives. A questionnaire titled 'Form A-1' was filled by the supervisors to document their view of the deviant behaviors of their subordinates. The second questionnaire, titled 'Form B', was given to the subordinates selected by the supervisor and for whom they had filled out Form A-1. The cover letter was also given to the participating organizations to inform them of the details and protocol for completing the forms.

One hundred and sixty responses were received, of which 122 matched; useable responses were analyzed for the study. The supervisors who responded to the questionnaire comprised males (77.9 percent) and females (22.1 percent) aged 25–40 years. Supervisors mostly belonged to the middle level (65.6 percent); 67.2 percent of their subordinates were male while 32.8 percent were female, and 50 percent fell within the age bracket of 25–30 years.

3.2. Measures

The following measures were employed for the selected constructs. Using a 5-point Likert scale, each item was assessed from 1 = strongly disagree to 5 = strongly agree.

Supervisor perspective:

- Interpersonal deviance (ID) was assessed by a seven-item scale (Bennett & Robinson, 2000).

- Organizational deviance (OD) was assessed by a ten-item scale (Bennett & Robinson, 2000). The items include 'come in late to work without permission' and 'spend too much time fantasizing or daydreaming instead of working'.

Employee perspective:

- Abusive supervision (AS): The perception of abusive supervision was measured by a 15-item scale by Tepper (2000). The sample items were 'my supervisor ridicules me' and 'my supervisor reminds me of my past mistakes and failures'.

- Psychological safety (PS): The perception of psychological safety (employee's perspective) is measured based on a four-item scale of the original seven items in Edmondson (1999). A sample item includes 'the people in our organization value others' unique skills and talents'.

- Organizational identification (OID), a moderator, is measured on a six-item scale by Mael and Ashforth (1992). The sample items include 'this organization's successes are my successes' and 'when someone criticizes my organization, it feels like a personal insult'.

4. Results and Discussion

4.1. *Data and Model Validation*

Before analyzing the data, I carry out several quality checks related to the data quality. The results show no potential risk of non-normality as the skewness and kurtosis values lie within the specified range of ±2 (Cain et al., 2016). For instance, the skewness and kurtosis statistics for abusive supervision, organizational identification, psychological safety, and interpersonal and organizational deviance are (0.72, -0.47, -1.2, 0.79, and 0.46) and (-0.018, -0.35, 0.20, 0.24, and -0.25) respectively. Further, to identify the potential multi-collinearity in the model, the study regresses independent variables against dependent variables (i.e., ID and OD). All VIF values are below 2, meeting the threshold of 5 (James et al., 2014). This shows that our data shows no evidence of multi-collinearity.

Table 1: Evaluation of the Measurement Model

Constructs	Cronbach's Alpha	Composite reliability	AVE	MSV	Items	Item loadings
Abusive Supervision	0.961	0.963	0.638	0.089	B_AS1	0.726
					B_AS2	0.794
					B_AS3	0.514
					B_AS4	0.857
					B_AS5	0.791
					B_AS6	0.787
					B_AS7	0.902
					B_AS8	0.888
					B_AS9	0.803
					B_AS10	0.872
					B_AS11	0.824
					B_AS12	0.831
					B_AS13	0.712
					B_AS14	0.795
					B_AS15	0.805

Constructs	Cronbach's Alpha	Composite reliability	AVE	MSV	Items	Item loadings
Psychological Safety	0.949	0.947	0.722	0.121	B_PS3	0.9
					B_PS2	0.735
					B_PS1	0.749
					B_PS4	0.752
					B_PS5	0.881
					B_PS6	0.964
					B_PS7	0.934
Organizational Identification	0.926	0.928	0.684	0.121	B_OI6	0.636
					B_OI5	0.854
					B_OI4	0.905
					B_OI3	0.854
					B_OI2	0.912
					B_OI1	0.768
Interpersonal deviance	0.885	0.890	0.539	0.417	A1_ID1	0.642
					A1_ID2	0.718
					A1_ID3	0.714
					A1_ID4	0.74
					A1_ID5	0.675
					A1_ID6	0.83
					A1_ID7	0.8
Organizational deviance					A1_OD8	0.622
					A1_OD9	0.543
					A1_OD10	0.527
	0.859	0.859	0.500	0.417	A1_OD11	0.808
					A1_OD12	0.767
					A1_OD13	0.623
					A1_OD14	0.748
					A1_OD15	0.669
					A1_OD18	0.548
					A1_OD19	0.588

For measuring model validity and reliability, the study used Cronbach's alpha values, average variance extracted (AVE), and composite reliability. The alpha values are above the threshold of 0.7 (Henseler et al., 2009). Similarly, the internal consistency of the constructs holds because the factor loadings for all the items exceed 0.5 (Hair et al., 2010). Table 1 shows the values for composite reliability and AVE. The composite reliability value for interpersonal deviance is 0.89, for organizational deviance is 0.859, for psychological safety is 0.947, for organizational identification is 0.928, and for abusive supervision is 0.963. The values confirm the convergent validity.

Additionally, discriminant validity is measured by following Fornell and Larcker (1981), according to whom the square root of the AVE values must exceed their corresponding inter-construct correlations. Table 2 shows that all the values meet the criteria, thus suggesting satisfactory discriminant validity for the constructs.

Table 2: Discriminant Validity Values

	1	2	3	4	5
1. Interpersonal deviance	0.734				
2. Organizational Identification	-0.136	0.827			
3. Psychological Safety	-0.188	0.348	0.850		
4. Abusive Supervision	0.207	-0.299	0.123	0.799	
5. Organizational deviance	0.646	-0.106	-0.042	0.271	0.662

Note: N = 122

4.2. Hypothesis Testing

Table 3 provides the summary statistics, including the mean, standard deviation and correlation. Abusive supervision is positively correlated with both ID ($r = 0.20$, $p < 0.05$) and OD ($r = 0.28$, $p < 0.01$). Furthermore, abusive supervision is negatively correlated with OID ($r = -0.27$, $p < 0.01$).

Table 3: Descriptive Analysis

	Mean	SD	1	2	3	4	5
Abusive supervision	1.93	0.82	1				
Psychological safety	3.61	1.01	0.057	1			
Organizational identification	3.71	0.87	-0.277**	0.377**	1		
Interpersonal deviance	1.92	0.71	0.207*	-0.197*	-0.130	1	
Organizational deviance	1.88	0.59	0.286**	-0.105	-0.118	0.626**	1

Note: N = 122, ** $p < 0.01$; * $p < 0.05$

To test the hypothesized relationships, hierarchical linear modeling (HLM) is employed, which allows us to control for effects when testing the hypotheses (Hofmann, 1997). Tables 4 and 5 present the results of the hierarchical regression analysis for the hypothesized variables. Hypothesis 1 theorized the positive relationship between abusive supervision and ID. The results portray the positive link between abusive supervision and ID (β

= 0.21, SE = 0.08, p < 0.05). Similarly, Hypothesis 2 posited the positive link between abusive supervision and OD (Table 5). The results confirm this positive relationship (β= 0.28, S.E = 0.06, p < 0.01). Thus, the study found support for Hypotheses 1 and 2.

Table 4: Interpersonal Deviance as the Dependent Variable

Variables	H1				H3			
	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI
Intercept	1.56***	0.17	1.24	1.89	1.92***	0.06	1.80	2.04
Abusive supervision	0.21*	0.08	0.03	0.34	0.2*	0.08	0.05	0.36
Psychological safety					-0.17*	0.07	-0.30	-0.03
AS x PS					-0.07	0.09	-0.25	0.11
R	0.21				0.30			
R squared	0.04				0.09			
F (1, 120)	5.37*			F (3, 118)	4.0*			

Note: N = 122, *** p < 0.001; * p <0.05

Next, the study examines the moderating effects. The research tests Hypotheses 3 and 4 using Hayes's (2013) process macro (Tables 4 and 5). Hypothesis 3 is not supported as the interaction term abusive supervision and psychological safety (AS x PS) (β= -0.07, SE = 0.09, CI = [-0.25, 0.11]) is not significant. In contrast, the interaction effects of abusive supervision and organizational identification (AS x OID) on OD are statistically significant (β= -0.18, SE = 0.08, CI = [-0.35, -0.01]), providing support for Hypothesis 4. Table 5 shows that the value of R-squared improves when a moderator is introduced, showing an improvement in the model.

Table 5: Organizational Deviance as the Dependent Variable

Variables	H2				H4			
	B	SE	LLCI	ULCI	B	SE	LLCI	ULCI
Intercept	1.48***	0.133	1.223	1.748	1.58***	0.12	1.34	1.82
Abusive Supervision	0.28**	0.063	0.081	0.332	0.14*	0.07	0.01	0.28
OID					-0.07	0.06	-0.19	0.06
AS x OID					-0.18*	0.08	-0.35	-0.01
R	0.28				0.4			
R squared	0.08				0.16			
F (1, 120)	10.66**			F (3, 118)	5.42***			

Note: N = 122, *** p < 0.001; ** p < 0.01; * p <0.05

Moderation plots provide an understanding of these moderating effects for Hypotheses 3 and 4. The study uses +1 SD above and below the mean criteria to plot moderation graphs (Aiken et al., 1991; Stone & Hollenbeck, 1989). Figures 2 and 3 show the moderating effects for high/low levels of OID and high/low levels of PS, respectively. Simple slope analysis helps to understand the significant effects through conditional effects. Figure 2 shows the moderation graph for Hypothesis 3. The graphical representation of slopes shows that the relationship between abusive supervision and ID is significant and stronger for employees with low PS (β= 0.27, SE = 0.13, CI = [0.02, 0.53]). At the same time, the effects are weaker but insignificant for employees with high PS (β= 0.13, SE = 0.11, ns). This suggests that ID is more pronounced for employees with low PS than for those with high PS.

Figure 2: Moderating effects of Psychological Safety (PS) for the relationship between Abusive Supervision (AS) and Interpersonal Deviance (ID)
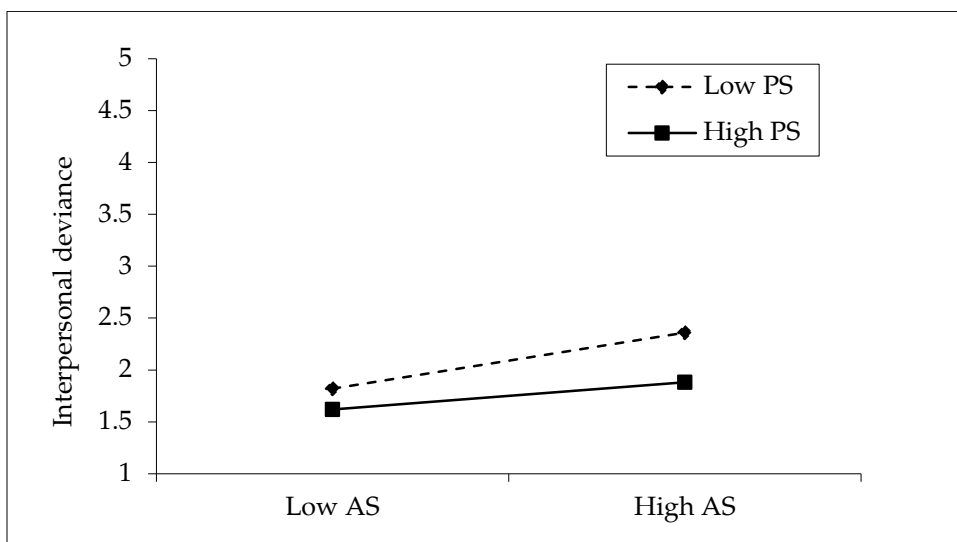
Figure 3 provides a graphical representation of the slopes for OID. The graph shows that the link between abusive supervision and OD is significant and stronger for employees with low OID (β= 0.30, SE = 0.1, CI = [0.11, 0.49]). In contrast, the relationship is insignificant for high OID (β= -0.01, SE = 0.1, CI = [-0.22, 0.19]). This suggests that employees' tendency toward OD increases under abusive supervision, specifically for those with low OID. This supports the hypothesis that employees with low OID are involved in harmful consequences under abusive supervisors.

Figure 3: Moderating effects of Organizational Identification (OID) for the relationship between Abusive Supervision (AS) and Organizational Deviance (OD)
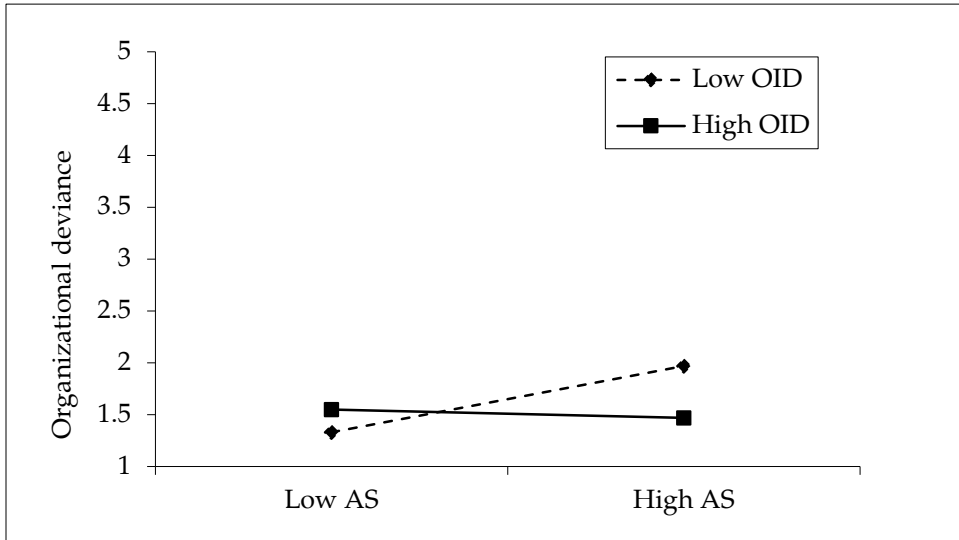
5. Conclusion

The model developed in this study focuses on how an abusive supervisor is associated with interpersonal and organizational deviance. Using psychological safety and organizational identification, this study attempted to develop a conceptual framework to clarify the role of workplace deviance within an organization. The proposed model and its hypotheses are an addition to the literature.

5.1. Theoretical Implications

The study looks at the consequences of abusive supervision. Using a resource-based perspective, this study examines workplace deviance as a consequence of stress resulting from abusive supervision. Although negative perceptions at work are predominantly reported as being positively associated with deviant behaviors (Colbert et al., 2004; Khaleel & Chelliah, 2023), the relationship between such behavioral dispositions and attitudinal outcomes and processes needs further consideration (Cohen, 2016). The study extends psychological and personal resources as moderators affecting the employees' ability to restore the resources they lose when facing an abusive supervisor.

These findings are aligned with the literature where perceptions of negative outcomes at work have been linked to the potential to obstruct others (Aryee et al., 2007). The study extends this by separately identifying the effect of abusive supervisors on interpersonal and organizational deviance.

The results show that individuals' intent to harm others at the interpersonal level can be affected by their psychological capital. The impact of abusive supervisors is adverse when employees' psychological capital is low. While the interaction term is insignificant, the interpretation can be based on significant conditional value and graphical representation (Figure 2). These results add to the literature on intrinsic motivational states (Mackey et al., 2015; Raza et al., 2019). Thus, our research offers new insights by showing that high level of psychological resources help individuals build resources and overcome the negative effects of abusive supervision.

Lastly, our study extends the discussion on organizational identification as a coping resource. In particular, the study emphasizes the role of coping resources as a moderating mechanism (Harvey et al., 2007; Nandkeolyar et al., 2014). Even when employees feel stressed due to abusive supervisors, coping resources act as a buffer. This shows that high organizational identification constitutes a coping resource beyond positive affect (Harvey et al., 2007).

More fundamentally, our study shows that multiple coping resources exist through which the impact of abusive supervision on counterproductive behavior is reduced. These findings identify moderating mechanisms that buffer the effects of abusive supervisors.

5.2. Practical Implications

To reduce the prevalence of abusive supervisors and deviant workplace behaviors, organizations should foster management practices that encourage employees to engage in positive behaviors (Colbert et al., 2004). These insights are salient because the prevalence of abusive supervision is higher in Asian countries (Tepper et al., 2017). Thus, this study offers ways to reduce the negative effects of abusive supervision in the workplace.

Abusive supervision negatively influences employees' interpersonal relations and attitudes toward organizations. Thus, in the presence of

abusive supervisors, management should strive to limit employees' tendencies toward deviant acts because involvement in ID or OD will make the situation worse. The management should train employees to engage in functional self-talk (Heslin & Latham, 2004) so that the risk of ID and OD is reduced. This can be done by increasing psychological safety, enabling employees to invest their energy at work (Frazier et al., 2017). Accordingly, to reduce stress and alleviate negative attitudes, managers need to enable norms of support and devotedness among employees to increase perceptions of high psychological safety (Martin et al., 2005). Increased perceptions of psychological safety may help increase employees' identification with the organization. Increased OID enables them to protect organizational norms and interests (Blader et al., 2017).

5.3. Future Research Directions

This study uses two-source data to show the extent to which deviance can hinder an organization's potential, resulting from supervisors' behavioral disposition. Future studies could replicate the results through longitudinal analysis.

The present study identified two moderators, leaving sufficient potential for future research. First, methodological dynamics of psychological safety can be recorded in more than one way to see if the results change for cross-sectional data, diary-study data or different points in time (longitudinal study). Other studies could also introduce several other moderators to provide a richer picture. For instance, other off-the-job moderators, including nonwork-related moderators, could be empirically analyzed (Tepper et al., 2017). This research focused on the trickle-down effect of abusive supervision, whereas future research could also look at the victimization perspective (Shillamkwese et al., 2020).

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Impact of Workplace Incivility on Work-Family Conflict: The Mediating Role of Emotional Exhaustion and Moderating Role of Job Experience

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Abstract: *This study tests the role of emotional exhaustion as a mediating mechanism between workplace incivility instigated by three sources (i.e., customers, co-workers and supervisors) and work-family conflict (WFC). We test the role of job experience as a boundary condition affecting the indirect relationship between supervisor incivility and WFC via emotional exhaustion. The sample consists of 235 front-line restaurant workers employed in casual and fine-dining restaurants in Lahore, Pakistan. Structural equation modeling is used to test the hypothesized relationships. Customer incivility, co-worker incivility and supervisor incivility are positively associated with WFC. Emotional exhaustion mediates the relationship between workplace incivility instigated by the three sources listed above and WFC. Job experience strengthens the positive indirect effect of supervisor incivility on WFC via emotional exhaustion. However, job experience does not affect the positive indirect effect of customer incivility and co-worker incivility on WFC via emotional exhaustion. The WFC literature mostly employs job experience as a control variable. This study is the first to examine job experience as a boundary condition affecting the indirect link between supervisor incivility and WFC via emotional exhaustion.*

Keywords: Workplace incivility, work-family conflict, emotional exhaustion, job experience, restaurant servers, Pakistan.

JEL Classification: M50, M51, M52, M54.

Impact of Workplace Incivility on Work-Family Conflict: The Mediating Role of Emotional Exhaustion and Moderating Role of Job Experience

1. Introduction

Workplace incivility is a ubiquitous phenomenon in the workplace and has serious consequences for individuals as well as organizations (Agarwal et al., 2023). Nearly everyone in the workplace has experienced workplace incivility at some point in their working life (Han et al., 2022). Workplace incivility is defined as 'low-intensity deviant behavior with ambiguous intent to harm the target, in violation of workplace norms for mutual respect' (Andersson & Pearson, 1999, p. 457). It is a mild or subtle form of mistreatment whereby the intention to harm the interaction partner is not immediately obvious. Workplace incivility affects employees' sales performance (Sliter et al., 2012), job satisfaction and turnover intention (Chen & Wang, 2019; Han et al., 2016; Parray et al., 2023), absenteeism (Sliter & Boyd, 2015), counterproductive work behavior (Sakurai & Jex, 2012; Zahoor et al., 2019), job performance (Rhee et al., 2017), physical health (Cortina et al., 2022; Jorgensen et al., 2023), sleep quality (Demsky et al., 2019), unhealthy eating behavior (Liu et al., 2017) and maladaptive shopping behavior (Song et al., 2018). Workplace incivility also leads to work alienation (Xia et al., 2022), workplace loneliness (Kuriakose et al., 2023), emotional exhaustion (Sliter et al., 2010), psychological distress (Adams & Webster, 2013), marital dissatisfaction (Ferguson, 2012) and work-family conflict (WFC) (Lim & Lee, 2011; Zhou et al., 2019).

Workplace incivility has become pervasive and an area of concern for organizational scholars and practitioners (Schilpzand et al., 2016). Most research in Pakistan's context has examined the impact of uncivil workplace treatment on turnover intention (Mahfooz et al., 2017) and counterproductive work behavior (Zahoor et al., 2019). Few studies in the Pakistani context (Raja et al., 2018; Zahoor et al., 2019) have examined the impact of workplace incivility on employees' WFC.

Studies in Western contexts report inconsistent findings regarding the relationship between workplace incivility and WFC (Lim & Lee, 2011; Zhou et al., 2019). While Lim and Lee (2011) find that supervisor incivility is linked to WFC, Zhou et al. (2019) find that the variables are unrelated. Moreover, Zhou et al. (2019) report co-worker incivility to be linked to the target's perception of WFC. However, Lim and Lee (2011) find that co-

worker incivility is unrelated to WFC. This study examines job experience as a boundary condition affecting workplace incivility and the WFC relationship via emotional exhaustion. We propose to resolve these inconsistent findings by examining how and when workplace incivility impacts workers' WFC.

WFC is defined as 'a form of inter-role conflict in which role pressures from the work and family domains are mutually incompatible in some respect' (Greenhaus & Beutell, 1985, p. 77). The literature provides evidence that work issues permeate the family domain more easily than family issues do the work domain. This is because work boundaries are formally defined and strictly enforced, and family boundaries are less formally defined and not as strictly enforced. The literature has empirically tested the impact of organizational citizenship behavior (Bolino et al., 2023), authoritarian leadership (Yao et al., 2023), social stressors (Pluut et al., 2022), workload (Babic et al., 2019), workaholism (Andreassen et al., 2013) and job pressure (Annor & Burchell, 2018) on WFC, but the effect of interpersonal workplace stressors, such as workplace incivility, has not been widely studied.

The WFC literature mostly employs job experience as a control variable. This study contributes to the literature by examining job experience as a boundary condition. The findings indicate that job experience exacerbates the effect of emotional exhaustion on WFC. Individuals possess different types of personal resources. Physical resources include health, vitality and energy; psychological resources include mental resilience, self-efficacy and optimism; affective resources include a positive mood, empathy and gratitude; intellectual resources include knowledge, skills, abilities and experience; and capital resources include time and money (Brummelhuis & Bakker, 2012).

The results indicate that despite the wide repertoire of skills, knowledge and competencies gained through years of job experience, long-tenure employees experience greater emotional exhaustion and WFC than short-tenure employees. It can be inferred that although long-tenure employees can accumulate a wide range of cognitive-intellectual resources throughout their working lives, these resources are insufficient to effectively cope with emotional work demands and improve employees' functioning in the family domain.

This study supports the conservation-of-resources (COR) theory in that social stressors (i.e., workplace incivility) in the work domain provoke

negative affective reactions (i.e., emotional exhaustion) among employees, which subsequently leads to poor functioning in the nonwork (family) domain, leading to WFC. Moreover, it appears that the cognitive resources (i.e., job experience) accumulated in employees' working lives are insufficient to effectively cope with the emotional demands (i.e., emotional exhaustion) elicited by supervisor incivility. This implies that emotional support resources are required to better cope with emotional work demands and that cognitive resources are required to deal with cognitive job demands more effectively. These findings have implications for organizational leaders and practitioners.

2.   Literature Review and Hypotheses Development

2.1. *Theoretical Framework*

COR theory contends that individuals have limited emotional and psychological resources that they seek to protect and conserve (Hobfoll, 1989). Resources can be classified into physical objects, personal dispositional characteristics, conditions and energies. Physical objects can include a house or a car; personal characteristics include a sense of optimism and self-efficacy; conditions include a good marriage; and energy includes money, time and physical health (Hobfoll, 1989). The COR literature has described the conditions under which stress occurs and role performance can be compromised: (a) the employee perceives the potential threat of resource loss, (b) the employee experiences actual loss of valuable resources, (c) the employee perceives their role demands to be greater than their reservoir of resources, and (d) the employee fails to replenish their resources after significant investment of emotional resources in work role demands (Hobfoll, 1989).

Borrowing insights from the COR theory, this study contends that workplace incivility depletes emotional resources, which increases emotional exhaustion for employees. Emotionally exhausted employees conserve their remaining personal resources by limiting their participation in the family domain, thereby experiencing increased WFC. A front-line service employee interacts with customers, co-workers and supervisors on a regular basis. Therefore, it is imperative to take into account different sources of incivility (customers, co-workers and supervisors) to provide a more holistic understanding of this phenomenon.

2.2. Customer Incivility and WFC

Sliter et al. (2010, p. 468) define customer incivility as 'low-intensity deviant behavior, perpetrated by someone in a customer or client role, with ambiguous intent to harm an employee, in violation of social norms of mutual respect and courtesy.' In a study conducted on Taiwanese tourist hotel chefs, workplace incivility was found to result in high turnover intention, while job satisfaction mediated this relationship (Chen & Wang, 2019).

Using a sample of nurses, Zhou et al. (2019) show that burnout transmits the impact of uncivil customer treatment on WFC. This study argues that workers prone to interactional workplace stressors feel compelled to spend more energy, time and emotional resources on work to avoid negative consequences, such as losing their jobs. Restaurant servers devoting maximum time and energy to deal with workplace stressors will have less time and energy to participate in the family domain. In light of the reviewed empirical findings, we hypothesize that:

Hypothesis 1a: There is a positive relationship between customer incivility and restaurant servers' perceptions of WFC.

2.3. Co-Worker Incivility and WFC

Co-worker incivility refers to uncivil behaviors perpetrated by co-workers, such as ignoring others or neglecting to say 'please' and 'thank you' (Pearson et al., 2001). Co-worker incivility threatens the target's need for belongingness and causes them to experience social exclusion and psychological distress (Abubakar, 2018). Demsky et al. (2019) show that negative work rumination explains the effect of co-worker incivility on workers' deteriorated sleep quality. The effect of ruminative thinking on insomnia symptoms weakens when psychological detachment is high. Lim and Lee (2011) indicate that co-worker incivility decreases the target's satisfaction with uncivil co-workers and increases the target's depression and perception of having received unfair treatment.

Ferguson (2012) finds that stress transmission explains the effect of co-worker incivility on targets' marital satisfaction. Sakurai and Jex (2012) find that co-worker incivility lowers the work effort of the targeted employees. Negative emotions do not allow individuals to concentrate on focal tasks because their attention is fixed on issues pertaining to co-worker incivility. Sliter et al. (2012) argue that co-worker incivility strengthens the

positive relationship between customer incivility and absenteeism as well as exacerbates the negative relationship between customer incivility and sales performance.

For a sample of Pakistani college employees, Zahoor et al. (2019) find that WFC exacerbates the positive relationship between workplace incivility and counterproductive work behavior. Employees who jointly experienced greater WFC and uncivil workplace treatment were more likely to exhibit counterproductive work behavior. This study argues that co-worker incivility can permeate into the nonwork domain when the targets of co-worker incivility spend extra time and mental energy reflecting on uncivil work encounters after working hours, robbing them of the cognitive and emotional resources needed to participate in the family domain effectively. Based on the above arguments, we hypothesize that:

Hypothesis 2a: There is a positive relationship between co-worker incivility and restaurant servers' perception of work-family conflict.

2.4. Supervisor Incivility and WFC

Pluut et al. (2022) argue that stressful workplace interactions (i.e., workplace incivility, abusive supervision and interpersonal conflict) have ripple effects on social interactions outside of work. Specifically, workplace social stressors elicit burnout symptoms among employees who have a greater propensity to trust their interaction partners. Uncivil workplace interactions deplete the self-regulatory resources of employees with a trusting disposition, making them less sociable and more withdrawn at home and increasing their risk of WFC.

Lim and Lee (2011) indicate that targets of supervisor incivility experience heightened WFC and lower supervisor satisfaction. The effect of workplace incivility depends on the job status of the instigator. Subordinates tend to be more sensitive to supervisors' behavior due to the latter's position of power and status within the organization. Therefore, employees experiencing incivility from supervisors report greater WFC. In line with Lim and Lee (2011), this study proposes that supervisor incivility depletes low-status restaurant servers' emotional resources where the state of exhaustion motivates them to conserve their psychological and emotional resources by reducing their participation in the family domain and as a result experience WFC. Based on these arguments, we hypothesize that:

Hypothesis 3a: There is a positive relationship between supervisor incivility and restaurant servers' perceptions of WFC.

2.5. *Emotional Exhaustion as Mediator in the Customer Incivility and WFC Relationship*

Greenbaum et al. (2014) find that emotional exhaustion explains the effect of customers' unethical behavior on employees' perception of WFC. Mahfooz et al. (2017) state that workplace incivility leads to turnover intention, with burnout mediating this relationship. Kern and Grandey (2009) find a significant positive relationship between customer incivility and emotional exhaustion. White employees are more likely to perceive uncivil treatment from customers as unfair and undeserving compared to Black employees. Moreover, while white employees were found to respond to customer incivility, minority employees were less likely to do so.

Zhou et al. (2019) find that burnout mediates the relationship between outsider incivility and WFC. In the healthcare context, outsider incivility refers to uncivilized behavior perpetrated by patients and visitors. Nurses who perceive a strong need to regulate their emotions in response to outsider incivility experience job-related burnout. Raja et al. (2018) find that job burnout transmits the effect of workplace bullying on WFC in a sample of government sector employees in Pakistan. Drawing on the COR theory, this study argues that customer incivility depletes workers' emotional and psychological resources. Emotionally exhausted employees conserve their emotional and psychological resources by limiting the time they spend with friends and family. Based on the above arguments, we hypothesize that:

Hypothesis 1b: Emotional exhaustion mediates the relationship between customer incivility and restaurant servers' perceptions of WFC.

2.6. *Emotional Exhaustion as Mediator in the Co-Worker Incivility and WFC Relationship*

Zhou et al. (2019) find that burnout explains the link between co-worker incivility and WFC. Rhee et al. (2017) find that emotional exhaustion fully mediates the relationship between co-worker incivility and front-line hotel employees' job performance. According to the job demand resource model, co-worker incivility is conceptualized as a job demand that deprives the target employee of emotional and psychological

resources, leaving them emotionally exhausted. According to the COR theory, employees experiencing co-worker incivility attempt to protect their leftover resources by withdrawing from job tasks. In a similar vein, we argue that co-worker incivility is a social stressor that depletes restaurant servers' limited emotional and psychological resources. In response to the threat of loss, servers attempt to conserve their finite resources by limiting participation in the family domain and experiencing greater WFC. In light of the above arguments, we hypothesize that:

Hypothesis 2b: Emotional exhaustion mediates the relationship between co-worker incivility and restaurant servers' perceptions of WFC.

2.7. *Emotional Exhaustion as Mediator in the Supervisor Incivility and WFC Relationship*

Supervisor incivility refers to uncivil behaviors perpetrated by supervisors, such as publicly embarrassing and ostracizing subordinates, passing hurtful comments or gossiping about subordinates (Reio, 2011). These behaviors signal to subordinates that their supervisors do not value their contributions, which depletes subordinates' emotional and social energy and results in psychological distress (Abubakar, 2018). Yao et al. (2023) find that authoritarian leaders arouse negative emotions among employees who are expected to refrain from expressing negative emotions in the workplace. Employees may spend considerable cognitive effort in suppressing negative emotions and continue to experience a cognitive burden until the negative emotion is released in a psychologically safe environment. The home and family domain is considered a psychologically safe nonwork environment that allows employees to vent their feelings. Employees burdened by emotional suppression have few personal resources available to fulfill family duties and are likely to experience greater WFC.

The research suggests that leaders' behaviors affect employee attitudes and behaviors outside the boundaries of work. Some leader behaviors may make it difficult for employees to manage their work-family interface (Tepper, 2000). Li et al. (2017) indicate that employees susceptible to supervisors' unethical behavior are prone to experiencing WFC. In a study on hotel managers and their partners, Krannitz et al. (2015) find that emotional exhaustion transmits the effect of a manager's surface acting at the workplace to a partner's perception of family conflict. Surface acting at the workplace affects employees' experiences at home, which is explained

by resource and spillover mechanisms. The resource mechanism posits that work activities deplete an individual's resources, hindering effective participation in the family domain. The spillover mechanism refers to the cross-domain transmission of moods, behaviors and experiences from one major sphere of life to another. Work events elicit emotions and moods that the employees carry to the home domain, which affects their experience at home (Bakker et al., 2009).

Supervisors have the authority to control important organizational resources such as promotions, rewards and compensation (Abubakar, 2018). Restaurant workers experience greater power imbalances and a lack of job control in response to supervisor incivility (Bradley, 2007). Supervisor incivility lowers subordinates' intrinsic motivation and job performance and increases their emotional exhaustion (Han et al., 2021). Drawing on the job demands and resources model, Guidetti et al. (2021) postulate that supervisor incivility as a job demand contributes to job-related burnout. In light of the reviewed empirical findings, we hypothesize that:

Hypothesis 3b: Emotional exhaustion mediates the relationship between supervisor incivility and restaurant servers' perceptions of WFC.

2.8. *Job Experience as a Moderator in the Supervisor Incivility-WFC Relationship through Emotional Exhaustion*

Kim et al. (2021) test the impact of developmental job experience on workers' innovative work behavior. Developmental job experience allows individuals to perform novel, diverse, complex, challenging and unfamiliar tasks to enhance their competencies and interpersonal skills. Job experience results in a personal learning experience that builds employees' sense of mastery, resilience and self-efficacy and promotes innovative work behavior. Drawing on transactional stress theory, job assignments perceived as a challenge induce positive psychological states while job assignments perceived as a threat induce negative psychological states.

Job assignments that are perceived as a challenge allow individuals to accumulate psychological capital because they expect to receive future gains from performing difficult tasks. In contrast, job assignments that are perceived as threats deplete employees' cognitive, emotional and psychological resources. Developmental job assignments yield benefits in the long but not short run. Employees who perform ambiguous and

complex job tasks are exposed to prolonged periods of stress and experience nervousness and anxiety. Complex job assignments deprive workers of psychological resources and, as a result, cause them to experience burnout, which undermines innovative work behavior.

Emotional exhaustion comprises three components: a person-specific stable trait that is time-invariant, an event-specific transitory state stimulated by a critical situational factor, and a malleable autoregressive trait that reflects the slow development of emotional exhaustion over time (Dicke et al., 2022). The three components represent how state-level emotional exhaustion metamorphoses into stable trait-level emotional exhaustion over the life course.

Starting from state-level emotional exhaustion, the temporal aspect plays a vital role in the development of stable trait-level emotional exhaustion. Dicke et al. (2022) suggest that early-career school principals experience state and autoregressive levels of emotional exhaustion while late-career school principals experience trait-based emotional exhaustion. With increasing levels of job experience over time, autoregressive emotional exhaustion transforms into more stable trait-level emotional exhaustion. Differences in job experience reflect a maturation effect whereby emotional exhaustion is malleable until individuals reach early adulthood, after which emotional exhaustion becomes more stable and trait-like.

In line with Dicke et al. (2022), this study contends that late-career restaurant servers experience stable trait-level emotional exhaustion compared to novice restaurant servers. We speculate that restaurant servers' emotional exhaustion is exacerbated in proportion to their job tenure. Mid- and late-career restaurant workers are likely to have encountered more instances of supervisor incivility and experienced greater emotional exhaustion than early-career restaurant workers. Compared to early-career restaurant workers, mid- and late-career restaurant workers will attempt to conserve finite resources by limiting their participation in the family domain and experiencing greater WFC. Based on the reviewed literature, we hypothesize:

Hypothesis 4:   Job experience moderates the relationship between incivility instigated by the supervisor and WFC through emotional exhaustion, such that employees with longer tenure in customer service roles experience greater emotional exhaustion and thereby greater WFC.

3.   Research Methodology

3.1. *Sample and Procedure*

We employed a self-administered paper-and-pencil survey to collect data at a single point in time from front-line restaurant employees who interacted with customers, co-workers and supervisors on a daily basis in casual and fine dining restaurants in Lahore, Pakistan. Purposive sampling was used to select the restaurants, while convenience sampling was used to select the study participants.

The researcher visited the head offices of two restaurants based in Lahore to solicit permission for data collection. The relevant human resource personnel agreed to share their contact information. Emails were sent to the respective human resource departments to obtain official permission for data collection. The researcher waited approximately two weeks until one restaurant formally provided permission to collect the data.

In the meantime, the researcher visited coffee houses, food courts and fine dining restaurants located in two big malls in Lahore. The researcher met shift managers and explained the purpose of the research. The shift manager granted permission for the data collection and offered space within the vicinity of the restaurant to solicit responses. One study participant would appear at a time, and the researcher would read out the instructions, statements and answer choices clearly, to which participants responded verbally and the researcher recorded the responses. After completion of the survey, the respondents received a cash award of PKR100 as compensation for participating. Expenses related to the data collection were borne by the researcher.

After two weeks, a big fast-food restaurant in Lahore formally gave permission to survey restaurant employees. The researcher abandoned the walk-in data collection process and opted to collect data through official means. A vacant room at the restaurant site was allocated for the purpose of data collection. The restaurant manager sent in five to six participants at a time. The researcher distributed a paper-and-pencil questionnaire to each study participant, explained the purpose of the study, and ensured the anonymity of the responses. The researcher read the instructions and questionnaire statements clearly and participants were given a few seconds to record their responses. Employees at this restaurant did not accept cash incentives as the management did not allow them to accept tips.

The literature on workplace incivility employs a varied sample size. In previous studies, the sample size ranged from 59 respondents (Walker et al., 2014) to 226 respondents (Chen & Wang, 2019). Based on past studies and evidence, we employ a sample size of 235 respondents. Out of 400 questionnaires that were distributed, 235 were considered usable for analysis.

3.2. Measures

A close-ended questionnaire was used to solicit participants' responses. All the constructs were measured using pre-existing and pre-established scales. The scales were available in English and adapted into Urdu through translation and back-translation. The questionnaire was pre-tested on a sample of 14 respondents. After repeating the activity 14 times, it appeared that respondents took longer to understand certain words, and the meaning of these words had to be explained by the researcher. As a result, difficult words were replaced with easy-to-understand words. Overall, no major flaws in wording were found. None of the items used in the questionnaire were reverse-coded. Except for demographic variables, participants' responses were obtained on a 1–5-point Likert scale.

Wilson and Holmvall's (2013) scale, consisting of ten items, is used to measure customer incivility. An example of a sample item is 'Customers often blame me for a problem I did not cause.' The scale developed by Cortina et al. (2001), which consists of seven items, is used to measure co-worker incivility. An example of a sample item is 'My co-workers often put me down and treat me condescendingly.' Similarly, the scale developed by Cortina et al. (2001), consisting of seven items, is used to measure supervisor incivility. An example of a sample item is 'My supervisor often puts me down and treats me condescendingly.'

Maslach and Jackson's (1981) scale, consisting of eight items, is used to operationalize emotional exhaustion. An example of a sample item is 'I feel frustrated by my job.' The scale developed by Carlson et al. (2000), consisting of three items (strain-based measures), is used to operationalize the WFC construct. Studies involving emotional exhaustion and WFC have employed strain-based measures of WFC (Wagner et al., 2014). Therefore, strain-based WFC is used as a first-order construct in the current study. An example of a sample item is 'I am often so emotionally drained when I get home from work that it prevents me from contributing to my family.' Lastly, Wang et al. (2011) measure job experience as the number of years and months spent working as a customer service officer at a call center. We

define job experience as the number of years and months spent working as a customer service representative. Job experience is measured with the help of the following question: 'Please indicate the number of years you have worked as a customer service representative (e.g., four years).'

3.3. Data Analysis

Smart PLS 3.0 is used to perform confirmatory factor analysis and path analysis, and the SPSS PROCESS Macro is used to perform moderated mediation analysis. Approximately 87 percent of the respondents were male and 13 percent were female. The mean age of respondents was approximately 23 years. About 74 percent of the respondents were not married and 26 percent were married. The sample represents a clear majority of unmarried male respondents. The mean number of years of formal education attained was 11.697 years, suggesting that respondents' average level of education is up to the intermediate level. The respondents' average job experience was 4.197 years and the average salary was approximately PKR23,097.

In the measurement model, indicator reliability is assessed by checking the outer loadings of the indicator variables, as shown in Table 1. Consistent with Hair et al. (2009), a cut-off level of 0.6 is used; items with factor loadings below 0.6 are removed and those above 0.6 are retained. After deleting the items with low factor loadings, the measurement model achieved a satisfactory fit to the data (CMIN/df = 1.949, p = 0.000, RMSEA = 0.064, NFI = 0.880, TLI = 0.916, CFI = 0.936).

Table 1: Convergent Validity, Discriminant Validity and Factor Loadings

Variable Name	AVE (Convergent Validity)	Discriminant Validity	Factor Loadings
Customer Incivility (CI)	0.510	0.714	Retained 3 items from a total of 10 items
			0.820
			0.629
			0.678
Co-worker Incivility (CWI)	0.635	0.797	Retained 3 items from a total of 7 items
			0.879
			0.730
			0.775

Variable Name	AVE (Convergent Validity)	Discriminant Validity	Factor Loadings
Supervisor Incivility (SI)	0.527	0.726	Retained 4 items from a total of 7 items
			0.639
			0.768
			0.777
			0.711
Emotional Exhaustion (EE)	0.628	0.792	Retained 4 items from a total of 8 items
			0.826
			0.739
			0.820
			0.781
Work-Family Conflict (WFC)	0.749	0.866	Retained all 3 items as follows
			0.880
			0.911
			0.803

Convergent validity is assessed by the average variance extracted (AVE). Consistent with Hair et al. (2009), the cut-off point for convergent validity is 0.5 in the current study. The AVE of all the latent constructs is found to be above 0.5, as shown in Table 1. Discriminant validity measures the degree to which a given latent construct is different from other latent constructs in the model (Hair et al., 2009). The square root of AVE is greater than the inter-factor correlations of that factor with all other factors, indicating that discriminant validity holds. The VIF values of all latent constructs are less than 3.0, suggesting multi-collinearity is not present (Hair et al., 2009). The summated factor scores of each construct are created using items in the measurement model, and these factor scores are used to conduct path analysis.

4. Empirical Results

Table 2 presents the means, standard deviations, reliability coefficients and correlations of the study variables. All the latent constructs are found to be positively correlated with each other and all the correlations are significant except one. The highest positive correlation occurs between supervisor incivility and co-worker incivility ($r = 0.607$, $p < 0.01$). The customer incivility construct has a Cronbach's alpha value of 0.515, co-worker incivility has a value of 0.727, supervisor incivility has a value of 0.721, emotional exhaustion has a value of 0.803, and WFC has a value of 0.831.

The selected cut-off point of Cronbach's alpha in the current study is 0.7 (Hair et al., 2009). The Cronbach's alpha value of the customer incivility construct is below 0.70 because seven items with factor loadings below 0.6 were dropped to improve the model fit and AVE. While the model fit improved and the AVE touched 0.5, Cronbach's alpha value dropped below 0.7 because the measure is sensitive to the number of items in a construct. Since the customer incivility construct has a composite reliability of 0.755, we considered the construct appropriate for further analysis. All the other latent variables have a Cronbach's alpha of above 0.7, indicating that the constructs are internally consistent.

Table 2: Means, Standard Deviations, Reliability Coefficients and Bivariate Correlations

	Mean	SD	1	2	3	4	5
1. Customer Incivility	0.2038	0.6575	(0.515)				
2. Co-worker Incivility	0.7271	0.7728	0.343**	(0.727)			
3. Supervisor Incivility	0.4626	0.6178	0.283**	0.607**	(0.721)		
4. Emotional Exhaustion	0.3457	0.9609	0.305**	0.304**	0.236**	(0.803)	
5. Work-Family Conflict	0.0823	0.2524	0.236**	0.216**	0.114	0.480**	(0.831)

Note: N = 235.
Cronbach's alpha values are reported along the diagonal in parentheses.
** Correlation values are significant at the 0.01 level (2-tailed).

As shown in Table 3, Hypothesis 1a, which proposes a positive relationship between customer incivility and WFC, is supported (β= 0.392, p = 0.000). Hypothesis 1b, which suggests a positive relationship between co-worker incivility and WFC, is also supported (β = 0.274, p = 0.000). Hypothesis 1c, which proposes a positive relationship between supervisor incivility and WFC, is also supported (β= 0.198, p = 0.001).

Table 3: Mediation Model predicting WFC from Customer Incivility, Co-worker Incivility and Supervisor Incivility mediated by Emotional Exhaustion

	Beta	t-stats	p-value	Mediation type
Customer Incivility is the independent variable				
CI → EE	0.356	5.500	0.000	
Mediator on outcome				
EE → WFC	0.466	7.831	0.000	
Direct effect				
CI → WFC	0.227	4.168	0.000	
Indirect effect				

	Beta	t-stats	p-value	Mediation type
CI → EE → WFC	0.166	4.401	0.000	Complementary mediation present
Co-worker Incivility is the independent variable				
CWI → EE	0.340	4.899	0.000	
Mediator on outcome				
EE → WFC	0.512	9.600	0.000	
Direct effect				
CWI → WFC	0.100	1.734	0.084	
Indirect effect				
CWI → EE → WFC	0.174	4.425	0.000	Indirect only mediation present
Supervisor Incivility is the independent variable				
SI → EE	0.265	3.486	0.001	
Mediator on outcome				
EE → WFC	0.531	9.874	0.000	
Direct effect				
SI → WFC	0.057	1.120	0.263	
Indirect effect				
SI → EE → WFC	0.141	3.291	0.001	Indirect only mediation present
Total effect				
CI → WFC	0.392	7.060	0.000	
CWI → WFC	0.274	5.032	0.000	
SI → WFC	0.198	3.397	0.001	
Moderated Mediation: SI is the independent variable				
SI → EE	0.267		0.000	
EE → WFC	0.336		0.001	
JE → WFC	-0.018		0.916	
EE*JE → WFC	0.045		0.020	

Note: N = 235. All coefficients are standardized coefficients.

Hypothesis 2a suggests that emotional exhaustion mediates the relationship between customer incivility and WFC. The indirect effect is examined at 95 percent confidence interval and is found to be significant (β = 0.166, t = 4.401, p = 0.000), which confirms that mediation exists. In the presence of emotional exhaustion as a mediator, the coefficient between customer incivility and WFC remains significant (β = 0.227, t = 4.168, p = 0.000), suggesting that the relationship between customer incivility and WFC is complementarily mediated by emotional exhaustion.

Hypothesis 2b suggests that emotional exhaustion mediates the relationship between co-worker incivility and WFC. The indirect effect is significant ($\beta = 0.174$, t = 4.425, p = 0.000), which confirms that mediation is present. When emotional exhaustion is used as a mediator, the coefficient between co-worker incivility and WFC becomes insignificant ($\beta = 0.100$, t-stat = 1.734, p-value = 0.084), indicating that the relationship between co-worker incivility and WFC is 'indirect only' or fully mediated by emotional exhaustion.

Hypothesis 2c suggests that emotional exhaustion mediates the relationship between supervisor incivility and WFC. The indirect effect is significant ($\beta = 0.141$, t = 3.291, p = 0.001), which confirms that mediation exists. When emotional exhaustion is applied as a mediator, the coefficient between supervisor incivility and WFC becomes insignificant ($\beta = 0.057$, t = 1.120, p = 0.263), suggesting that the relationship between supervisor incivility and WFC is 'indirect only' or fully mediated by emotional exhaustion.

Figure 1: Theoretical Framework
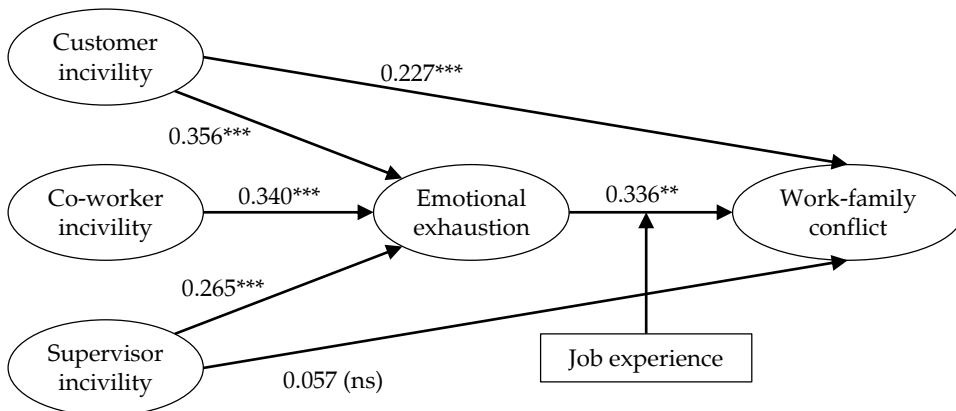
Hypothesis 4 suggests that the indirect effect from supervisor incivility to WFC via emotional exhaustion will be stronger for employees with longer job experience. Following Edwards and Lambert's (2007) approach, we compute the indirect effect of supervisor incivility (through emotional exhaustion) on WFC at low, average and high levels of job experience. Our data supports the hypothesis as the interaction term (emotional exhaustion x job experience) is significantly associated with WFC ($\beta = 0.045$, p = 0.020). The theoretical framework is shown in Figure 1.

As shown in Table 4, the results indicate that the greater the degree of supervisor incivility experienced by a restaurant server is, the greater the emotional exhaustion they will experience (b = 0.267, p = 0.000). The effect of supervisor incivility on WFC is statistically significant for all categories of work experience because the confidence interval does not straddle 0 for shorter, average and longer job experience. Although the indirect effect of supervisor incivility on WFC is significant for all three categories of employees, the effect is strongest for the third category of employees with longer work experience (mean + 1SD). The slope linking emotional exhaustion and WFC is steepest for employees with a higher number of years of job experience relative to employees with only a few years of job experience, as shown in Figure 2.

Table 4: Indirect effect of Supervisor Incivility (through Emotional Exhaustion) on WFC by level of Job Experience

Level of job experience	Job experience	First stage		Second stage		Indirect effect	
		b MX	SE	b YM	SE	b MX b YM	95% CI
Lesser job experience	0.914	0.267***	0.063	0.377***	0.086	0.101	[0.0322, 0.1838]
Mean job experience	4.197	0.267***	0.063	0.524***	0.056	0.139	[0.0633, 0.2175]
Longer job experience	7.480	0.267***	0.063	0.672***	0.082	0.179	[0.0804, 0.2741]

Note: *** Significant values at p < 0.001.

Figure 2: Job Experience exacerbates the positive relationship between Emotional Exhaustion and WFC
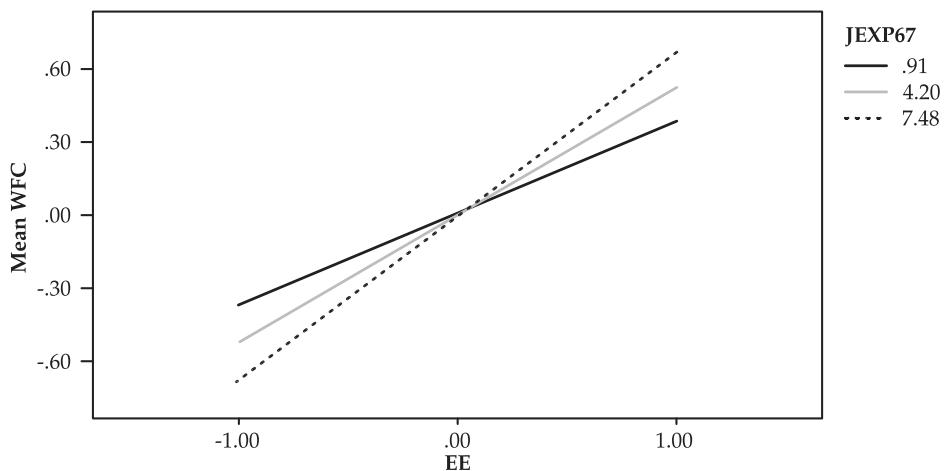
5. Discussion of Findings

Our results indicate that all three forms of workplace incivility (customer, co-worker and supervisor) are significantly related to WFC, suggesting that even less intense forms of disrespectful behavior by customers, co-workers and supervisors serve as sources of stress, robbing the employee of their emotional resources and contributing to their WFC. Multiple sources of incivility (customer, co-worker and supervisor) were included to fully represent the social environment of restaurants.

Our findings are partially consistent with those of Zhou et al. (2019), where both customer incivility and co-worker incivility were found to be positively related to WFC. In Zhou et al. (2019), supervisor incivility was found to be unrelated to WFC, whereas Lim and Lee (2011) found superior incivility to be positively related to WFC. Zhou et al. (2019) argue that the study used a five-week diary design during which nurses likely did not have enough occurrences of uncivil interaction with supervisors that could account for the variance in family conflict. Our findings pertaining to supervisor incivility are consistent with those of Lim and Lee (2011).

Compared to customer incivility and co-worker incivility, supervisor incivility has the weakest relationship with WFC. These findings are similar to those of Adams and Webster (2013), where the relationship between supervisor interpersonal mistreatment and psychological distress is weakest compared to the relationship between co-worker and customer interpersonal mistreatment and psychological distress.

Latané's (1981) social impact theory provides a relevant explanation by positing that the impact of mistreatment is not only determined by the position of power but also by the immediacy and frequency of interaction. Customers appear in large numbers at restaurants and restaurant servers spend more time interacting with customers than with supervisors. As customers appear in large numbers, the frequency of interaction increases and subsequently the likelihood of exposure to uncivil treatment from customers increases. Drawing on Latané (1981), we infer that due to the immediacy and access of customers, the customer incivility and WFC relationship is stronger than the supervisor incivility and WFC relationship.

Our mediation results are similar to those of Greenbaum et al. (2014), where emotional exhaustion mediates the impact of customers' unethical behavior on WFC. This finding also matches that of Zhou et al. (2019), where burnout explained the effect of co-worker incivility on WFC. The mediation

result for supervisor incivility is similar to Giumetti et al. (2013), who indicate that after experiencing supervisor incivility via email, employees experience emotional exhaustion and, as a result, withdraw effort from their work, thereby lowering their task performance and work engagement.

The moderated mediation analysis reveals that job experience strengthens the positive link between emotional exhaustion and WFC, such that longer job tenure results in greater WFC. Bradley (2007) found that the stressor-strain relationship is stronger among inexperienced workers than among experienced workers. Experienced workers have adapted better to the job environment and are thus better equipped to cope with challenging job demands than inexperienced employees.

Our results are contrary to those of Bradley (2007). In our study, experienced restaurant servers experienced greater emotional exhaustion than novice servers. A plausible explanation could be that late-career restaurant servers are caught up in a negative burnout cycle whereby individuals' personal resources are continuously depleted and not replenished to cope with workplace demands (Bakker & Costa, 2014). It is possible that the subtle nature of uncivil interactions is not immediately recognizable to younger, more inexperienced workers since they are not fully aware of job demands in their early careers. However, with increasing job experience, respondents are better able to recognize subtle forms of social stressors.

Our findings suggest that restaurant servers with longer customer service roles experience greater emotional exhaustion and greater WFC. WFC was higher for those who had experienced greater emotional exhaustion, but those who had longer job experience faced higher emotional exhaustion. Thus, WFC was found to be greater among employees who had longer job experience.

5.1. Theoretical Implications

COR theory posits that individuals have limited cognitive, emotional and psychological resources that they seek to protect and conserve (Hobfoll, 1989). Employees experience stress when they perceive the threat of loss or actual loss of valuable cognitive, emotional and psychological resources. Cognitive resources include job skills, experience, and knowledge; emotional resources include positive feelings and a sense of optimism; and psychological resources include the focus and attention required to perform a given task efficiently. This study provides support

for the COR theory in that workplace incivility imposes psychological and emotional demands that deplete employees' valuable cognitive and emotional resources, which results in emotional exhaustion.

Employees devote extra time and mental energy to ruminating about their work experiences during nonwork hours and experience emotional exhaustion as a result. Employees engage in defensive attempts to conserve their leftover resources by reducing their participation in the family domain and thus experience WFC (Zhou et al., 2019). In the context of the present study, an increased level of intellectual resources stemming from longer job experience did not help restaurant servers experience lower emotional exhaustion and lower WFC. We thus infer that intellectual cognitive resources cannot compensate for the depletion of emotional resources. Cognitive resources can be used to effectively cope with cognitive demands. Likewise, emotional resources can be used to effectively cope with emotional demands.

According to human capital theory (Becker, 1962), experienced employees perform better in job roles than less experienced employees. Earley et al. (1990) suggest that job experience allows employees to accumulate skills, knowledge, competencies and psychomotor abilities that improve performance. Job experience offers employees a period of learning during which they accumulate job-related capital, including human capital, social capital and psychological capital, which allows them to manage job demands. Long work experience leads to cognitive simplification of job tasks by converting complex cognitive schemas into simplistic habitual routines (Earley et al., 1990). According to the attentional view of stress, under stressful work conditions, experienced employees are better able to redirect their attention and concentrate better on key work tasks than inexperienced employees (Hunter & Thatcher, 2007).

However, our findings are contrary to human capital theory and the attentional view of stress. We find that the cognitive resources accumulated through extended job experience are not sufficient to overcome the depletion of emotional resources resulting from uncivil workplace interactions. The results suggest that the greater the work experience acquired by employees is, the less capable they become of effectively handling WFC, reinforcing the belief that only emotional resources can make up for emotional workplace demands and that cognitive resources can make up for cognitive workplace demands. Workplace incivility lowers restaurant servers' self-esteem, self-efficacy and sense of optimism. This study contends that emotional exhaustion resulting from a loss of emotional resources cannot be

compensated for by cognitive resources accumulated through long job tenure. These findings have implications for organizational leaders and practitioners to which we now turn.

5.2. Practical Implications

Organizational executives can take steps to lower the incidence of workplace incivility and break the negative burnout cycle, which will likely lower WFC. Organizational leaders must strive to establish a psychologically safe, respectful and ethical workplace climate that encourages ethical workplace behavior. This can be accomplished by introducing relaxation techniques and mindfulness programs (Dicke et al., 2022) as well as organizing professional development workshops (Yao et al., 2023) and implementing a civility, respect and engagement in the workforce (CREW) training program (Demsky et al., 2019).

The purpose of implementing CREW programs is to promote civil and respectful workplace interactions (Osatuke et al., 2009). Such programs cultivate an organizational climate of respect, fairness and mutual trust. Employees build their capacity to accept individual differences in the work group and treat their co-workers with respect. The ensuing respect and mutual trust increase feelings of empowerment and job satisfaction and lower employee burnout and turnover intention (Osatuke et al., 2009). Civil workplace interaction increases employee cooperation, teamwork, collective problem-solving, and fair conflict resolution (Osatuke et al., 2009), which likely results in improved customer experience and elicits repeat customer purchases. This study argues that CREW programs not only improve the quality of social workplace interactions but also improve an organization's bottom-line performance.

Restaurant managers should seek feedback from subordinates regarding their behavior and style of supervision. They should also build supportive relationships with and provide mentoring and socio-emotional support to employees (Tsagkanou et al., 2023). Restaurant managers must identify employees who frequently face customer incivility issues because a greater frequency of exposure to such incidents may indicate the need for development. Doing so would help restaurant managers develop a 'buddy system' by pairing an employee who encounters more customer incivility with an employee who encounters less customer incivility (Han et al., 2016).

Management could also encourage employees to initiate blogs and Facebook groups to discuss experiences of customer incivility and effective

strategies to handle such events. Moreover, workplace engagement programs, including sports events, competitions and employees' birthday celebrations, could be designed and implemented to give employees an opportunity to recover their emotional and psychological resources and improve workplace morale. Employee recognition and reward programs such as cash incentives, bonuses and employee-of-the-month certificates should be implemented to acknowledge employees' efforts to meet and exceed customer expectations. Such programs will likely improve employees' motivation to improve the quality of their social interactions.

Organizations should encourage employees to adopt perspective-taking behavior. Employees who do so consider customer problems personally relevant and attach greater importance to resolving such problems (Song et al., 2018). In order to foster perspective-taking behavior, organizations could consider offering 'lens-of-the-customer' training (Sliter et al., 2010) to train employees to take the time to understand the perspective of their interaction partners before enacting a response.

A more appropriate response to customer incivility may be emotional neutrality because being too positive or too negative can make things worse (Sliter et al., 2010). Service providers who fake positive expressions in response to incivility may be perceived as not being serious about customer concerns, whereas those expressing negative emotions in response to incivility could be perceived as rude and unprofessional. We suggest adopting an emotionally neutral tone to make customers feel that their concerns will be heard and addressed.

5.3. *Limitations and Future Research Directions*

The study is not without its limitations. First, the data was collected from a single country, which can affect the generalizability of the findings. Second, the study is subject to common method bias due to the cross-sectional research design, which we adopted owing to time and resource constraints. Third, the study sample comprised primarily of male respondents (87 percent), making it difficult to examine whether gender differences affected the proposed relationships. We suggest that future studies adopt time-lagged, longitudinal and experimental designs and collect data from different sources (i.e., supervisors, focal employees and co-workers) to reduce common method bias and determine causal relationships. Last, future researchers could choose to adopt a qualitative approach (i.e., interviews, observations and focus groups) to enrich and validate the present study's findings.

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Asymmetric Association among Technological Spillover, Absorptive Capacity and Economic Development: A NARDL Approach

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Abstract: *The spillover of external research and development (R&D) capital stock and the level of domestic human capital, as a source of absorptive capacity, plays a vital role in stimulating economic growth and development. The objective of this study is to examine the asymmetric associations among human capital, R&D stock spillover, capital import intensity, and output growth in Pakistan over the period 1982 to 2020. For this purpose, we develop and estimate a nonlinear autoregressive distributed lag (NARDL) model. The results of the bounds test confirm the presence of a long-run relationship, while the error correction model confirms the convergence from short-run to long-run equilibrium among the variables. The impact of machinery and technological good imports is positive on per capita GDP in the long run. In contrast, the impact of external R&D capital stock is symmetric in the short but becomes negative in the long run. The relationship between human capital and per capita GDP appears to be asymmetric because of low spending in the education sector. Based on these findings, we suggest that Pakistan should enhance its share of imports of high-tech products and improve its absorptive capacity for the effective use of external R&D resources.*

Keywords: Asymmetric association, technology spillover, economic development.

JEL Classification: B23, O01, O10.

Asymmetric Association among Technological Spillover, Absorptive Capacity and Economic Development: A NARDL Approach

1. Introduction

Developments in science and technology have changed the sources of growth, particularly in the twenty-first century. Knowledge-based capital, which includes digital information, information and communication technology (ICT), innovation, international mobility of people and external technology, is the key to spurring new sources of output growth. Trade of capital goods, machinery and high-tech products and foreign direct investment (FDI) are the two most significant channels of external technological transformation. Both trade and FDI, as carriers of foreign technology and knowledge, have positive effects on the economic growth of the host country (Chengying et al., 2023). However, this positive role of external sources of technology and knowledge depends on the country's absorptive capacity.

Research and development (R&D) capital stock, both domestic and foreign, produces a sustainable level of production capabilities (Zhu et al., 2023). Empirical analysis shows that domestic R&D stock and expenditures by advanced economies on R&D affect innovation capacity, technological advancement and breakthroughs in the host countries and their trading partners (Grossman & Helpman, 1991). Crispolti and Marconi (2003) find that developing countries can benefit from active and passive spillovers through FDI and the import of capital goods and technology.

The import of capital-embodied goods enhances economic growth by incorporating a variety of foreign technological inputs into production processes, leading to massive spillovers. In comparison, active technological spillovers emerge if learning from foreign innovations and technology is purposive. Afzal and Mushtaq (2022) find that R&D yields a significant positive impact on the innovative capacity of growing economies. In this scenario, local firms not only adopt foreign technology spillovers but also build their technological capability to upgrade local production and innovation capacity.

Knowledge-based economic development tends to be concentrated in advanced industrial economies, while developing countries are generally not as involved in domestic R&D (Caetano & Marques, 2023). Developing

countries emerge as technological followers and simply adopt the innovations of their developed counterparts. Developing countries are often trapped in a vicious cycle of insufficient R&D, which hampers economic growth (Fang et al., 2022). In response, this low economic growth does not enable developing countries to advance their knowledge production. This is why several less-developed countries (LDCs) that had tried to improve their economic growth were not successful.

This struggle for improvement in economic conditions is referred to as the 'economic tragedy of the twentieth century' in empirical research (Artadi & Sala-i-Martin, 2003). Foreign technological spillovers transferred through imports and FDI would have a substantial positive effect on the productivity of developing countries if they had adequate domestic R&D capital stock (Keller, 2004). A significant knowledge and technology base is necessary for sound economic growth in today's knowledge-based global economy. Developing countries can take advantage of developed countries' knowledge and R&D capital stock if they have adequate domestic R&D capital stock (Keller, 2010).

Pakistan could also utilize technological and R&D spillovers by importing capital and machinery goods from its developed trading partners. Because it has an insignificant level of R&D capital domestically (Ali & Akhtar, 2023), it could capture technology spillovers by formulating a trade policy biased toward developed countries that are technologically advanced and have a large domestic R&D capital stock. However, Pakistan's foreign technological absorption capacity will depend on its domestic human capital stock. If Pakistan does not possess a threshold level of human capital stock, it cannot spur the benefit of any technological transformation channel. The objective of this study is to examine the asymmetric associations among human capital, R&D stock spillover, import intensity of capital, and output growth of Pakistan from 1982 to 2020. For our empirical analysis, we apply the NARDL method (Shin et al., 2014). This model examines the nonlinearity and nonstationary of impulses simultaneously and can capture the short-run and long-run associations among variables.

Our paper contributes to the literature in two ways. First, it investigates the asymmetric associations among human capital, R&D spillover, capital import intensity, and output growth of Pakistan. Second, it estimates the impact of human capital as an absorption measure for capturing technological spillovers. External R&D is measured using the perpetual inventory method. In the case of Pakistan, this study evaluates the impact of international knowledge and technological spillovers on output

growth by considering both channels of international technological spillover transfer. To the best of our knowledge, no research has been conducted on the asymmetric relationship between foreign technological spillovers and economic growth in Pakistan.

The rest of the study is organized as follows. The next section presents a review of the literature and hypothesis development. Section 3 describes the methodology, including model specification, data sources, construction of variables and estimation approach. Section 4 presents the discussion, and the last section presents the conclusion and policy suggestions.

2.   Literature Review and Hypothesis Development

Knowledge is treated as a vital endogenous factor of economic development, following the endogenous growth theory presented by Romer (1990), Lucas (1988), and Grossman and Helpman (1991). Economic liberalization denotes trade liberalization and financial liberalization. The former refers to lessening trade restrictions, while the latter describes capital mobility through foreign direct and portfolio investment or labor force mobility. The effect of economic liberalization (good or bad) on LDC economies led to a key policy debate. Endogenous growth theory proposes that the sustainable growth of a country depends on technological innovation and progress as these factors have a multiplier effect on growth through the transmission of technological knowledge (Wang et al. 2019). Therefore, the domestic stock of technological knowledge is an aggregate of domestic and foreign technological knowledge (Stöllinger, 2013).

Kim and Lee (2004) explain that the spillover of foreign technological knowledge is inhibited by transnational innovation. The industrial knowledge and advanced technological capital stocks of developed countries have increased their global specialization. Thus, developing countries formulate links with developed countries to capture technology spillovers. This investment motive is termed 'technology acquisition' or 'technology sourcing' (Neven & Siotis, 1996). Therefore, we hypothesize that importing machinery and other technological goods will positively influence output growth in the short and long run.

Hypothesis 1: Imports of machinery and technological goods will positively impact output growth in both the short and long run.

Significant work has been done on why developing countries fail to capture the foreign R&D spillovers of advanced countries (Pandey et al., 2022). R&D spillovers refer to the procedure of utilizing process-oriented and product-oriented innovations diffused by developed countries. Such innovations lead to new production and higher production quality at a lower average cost. Griliches (1998) explains this typology of R&D spillover as knowledge spillovers and rent spillovers.

Knowledge spillovers are further categorized into two types of spillovers: 'imitation-enhancing' and 'idea-creating spillovers'. Imitation-enhancing knowledge spillovers refer to capturing and imitating unprotected codified knowledge by other innovators. Idea-creating knowledge spillovers refer to the importance of past accumulated knowledge stock in the creation of new knowledge and ideas. Mostly, product orientation leads to R&D activities and knowledge spillovers lead to R&D spillovers. Moreover, product innovation is less likely to be protected than knowledge spillovers (Los & Verspagen, 2003). We argue that technology spills over via knowledge spillovers. In this context, we postulate that foreign R&D capital stock positively influences output growth:

Hypothesis 2: Foreign R&D capital stock will likely impact output growth positively.

According to the convergence hypothesis of neoclassical growth theory, local investment in human and institutional capital is critical for technological diffusion in developing countries (Rosenberg & Frischtak, 1985). The role of human capital is also explained by Todaro and Smith (2020), Matousek and Tzeremes (2021), Wang et al. (2022) and Asaleye and Strydom (2022). The political elites in developing countries block such sources of technological development and structural change by opposing policies that develop an adequate absorption capacity if these policies contravene their interests, motives and advantages (Acemoglu & Robinson, 2006).

Griliches (1992) states that the rate of return from investing in physical infrastructure is much lower than that from investing in R&D. R&D spillovers are significant for survival in the global economy and enable competition among developed and developing countries (Coe & Helpman, 1995). Developing countries can utilize the domestic R&D capital stock of developed countries by ensuring that their import-to-GDP ratio is biased toward capital and technological imports from technologically advanced trade partners and toward capital imports.

Domestic R&D capital stock is also preliminary, along with foreign R&D capital stock. However, we have dropped this variable from the model because Pakistan does not have enough domestic R&D capital stock. In this context, we hypothesize that the relationship between foreign R&D capital stock and output growth is dependent on the absorptive capacity of the host country.

Hypothesis 3: The impact of foreign R&D capital stock on output growth depends on the absorptive capacity of the host country.

The importance of the quality of institutions in Colombian trade with the rest of Latin America was determined by Abreo et al. (2021). Their results highlight the significant impact of the institutional quality gap between Colombia and its trading partners, particularly regarding government effectiveness. Sabir et al. (2019) investigate the importance of institutions for FDI, using data from a panel of developing low-income and high-income countries for 1996–2016. They find that institutional quality benefits FDI for all categories of countries.

The long-run positive association between institutional quality and FDI is also revealed by Yakubu (2020), who applied the autoregressive distributed lag technique to data for Ghana for 1985 to 2016. A barrier to FDI-led growth is that emerging countries have less developed institutional frameworks than wealthy countries. The core place in global FDI is attributable to technological progress, while knowledge has a strong moderating influence (Sultana & Turkina, 2020). Similarly, Vu and Ho (2020) establish that FDI plays a crucial role in low-income provinces because of four key factors: human capital, level of openness, infrastructure and absorptive capacity of local enterprises.

The importance of FDI for output growth is also explained by You and Xiao (2022), Yu et al. (2021), Ciobanu (2021), and Farooq et al. (2020). Afzal and Ahmad (2018) analyze the sources of productivity growth to examine the impact of technological advancement on output growth. They find that ICT, governance and gross domestic investment positively and significantly impact the productivity of growing Asian economies. As a result, external technology is hypothesized to improve output growth if the host country has appropriate absorptive capacity regarding human capital development.

Hypothesis 4: External technology is likely to promote output growth only if the host country has an adequate level of absorptive capacity in terms of human capital development.

Li and Tang (2019) review the association between international trade and technological progress and find that trade significantly increases total factor productivity and encourages businesses to engage in R&D activity. Massini et al. (2023) find that foreign trade businesses conducting R&D are relatively more productive. Similarly, external knowledge via foreign trade and FDI plays a vital role in stimulating regional industrial growth (Wang et al., 2020). Solomon and van Klyton (2020) find that digital technology plays an important role in the growth of output in Africa. As a result, we postulate that foreign trade is likely to be an important source of external technology transmission and helps to increase output growth.

Hypothesis 5: Foreign trade, as an important source of external technology transmission, positively impacts output growth.

Afzal et al. (2020) investigate the critical sources of national innovative capacity among technologically advanced countries from 1996 to 2015. For this purpose, they empirically examine the impact of ICT, human capital development, R&D expenditure, governance, financial development (FD) and exposure to external technology (EET) on innovation capabilities, using fixed effects estimation. They find that human capital, R&D expenditure, governance, FD and EET generate important positive roles in enhancing innovation. While several studies on Pakistan, such as Hye (2012), Jawaid (2014), Adeel-Farooq et al. (2017) and Yasmin et al. (2006), have explored the association between liberalization and economic growth, no study has assessed the asymmetric relationship between foreign technology-embodied capital imports and domestic technological breakthroughs of advanced trading partners on Pakistan's economic growth. Therefore, we form the following hypotheses.

Hypothesis 6: There is a long-run association among human capital, R&D stock spillover, capital import intensity, and output growth in Pakistan.

Hypothesis 7: The model will likely be stable and converge from short-run to long-run equilibrium.

3. Methodology

This section presents our empirical analysis, including the model specification, definitions and construction of variables, sources of data, and techniques of estimation.

3.1. Model Specification

The benefits of foreign R&D depend on absorptive capacity and learning and social capabilities such as social institutions, technological and educational competencies, the degree of infrastructure, and capital intensification in follower countries (Abramovitz, 1986; Baumol et al., 1989; Intisar et al. 2020). Coe et al. (1997) and Coe and Helpman (1995) find that international technological diffusion via machinery imports positively impacts the GDP of developing countries by stimulating productivity. Liu and Fan (2020) argue that international technological spillovers have a nonlinear association with economic growth, that is, various absorptive capacity factors maximize spillover effects when they are within two thresholds. Foreign R&D capital stock has an asymmetric association with economic growth as its positive and negative shocks have different impacts on growth.

Filippetti et al. (2016) explain that human capital has different effects on the absorption of technology spillovers domestically by influencing the turning point. The effect of spilled-over R&D stock, technology and knowledge transmission on economic growth depends on various absorptive capacity factors. After reaching a certain level of absorptive capacity, the positive influence of spillovers on the productivity and growth of the host country tends to emerge. A positive technology spillover effect may arise after a predetermined threshold as foreign and domestic enterprises' shares (Cantwell, 1989) and industrial growth attributes (Chen & Chen, 2006).

Developing countries with more open economies and a greater fraction of imports from developed countries rich in domestic R&D can capture more technology from abroad. However, the relative absorption of these spillovers depends on domestic attributes such as human capital, infrastructure and openness (Coe et al., 1997; Coe & Helpman, 1995; Jedwab et al., 2023; Nainggolan et al., 2022). Based on this discussion, the functional association can be expressed as follows:

$$\ln(Y)_t = \beta_0 + \beta_1 \ln(L)_t + \beta_2 \ln(K)_t + \beta_3 (MKG)_t + \beta_5 (FR\&D)_t + \beta_6 \ln(HR)_t + \mu_t \tag{1}$$

3.2. Definitions and Sources of Data

We analyze the asymmetric relationships among per capita GDP, imports of machinery and capital goods, level of foreign R&D capital and

human resources from 1982 to 2020. The data for per capita GDP, imports of capital goods, FDI and human capital have been obtained from the World Bank. The data on the labor force has been taken from the Pakistan Economic Survey. External R&D capital stock is measured using the perpetual inventory method, and sourced from the science and technology indicators of the OECD. In this model, GDP per capita is a proxy for output growth, and is denoted by Y_t. K, L, MKG, FR&D and HR represent gross fixed capital formation, employed labor force, imports of machinery and capital goods, external R&D capital and human capital, respectively. Human capital is measured as total enrollment in all educational institutions in Pakistan.

3.3. Construction of Variables

We measure external R&D capital as the domestic R&D expenditures of import partners, with the output ratio of the host country as a weight. Foreign R&D capital stock is measured using the real gross R&D expenditure of Pakistan's developed and advanced bilateral trading partners. The perpetual inventory method is used to calculate the R&D stock (S), using data for domestic R&D expenditures:

$$S_t = (1 - \alpha)S_{t-1} + R_{t-1} \tag{2}$$

where α indicates the standard 5 percent depreciation rate. Griliches' (1988) procedure has been used to calculate the benchmark R&D capital stock (S) as:

$$S_0 = {R_0}\big/{(g + \alpha)} \tag{3}$$

where g denotes the average annual growth of domestic expenditures on R&D over the available reported R&D data, R_0 is the initial R&D data for the first year and S_0 denotes the benchmark level of R&D capital for a technologically advanced country.

3.4. Estimation Techniques

The nonlinear autoregressive distributed lag framework (NARDL) developed by Shin et al. (2014) is used to estimate the model. NARDL is a popular technique for analyzing asymmetric and nonlinear relationships and is applied in different fields from energy economics and real estate economics to macroeconomic analysis. Several researchers have explored asymmetries in the impact of global trade spillovers on recipient countries in this manner. The NARDL method is flexible in terms of the order of

integration of the impulses: variables may be integrated of order I(0)/I(1) or a combination of both can be used (Shin et al., 2014).

This model simultaneously examines the nonlinearity and nonstationarity of impulses and can also capture the short-term and long-term asymmetric effects among variables. The NARDL method is deemed superior to smooth transitions as it simultaneously produces valid results for short-run and long-run co-integration and asymmetries for small sample sets (Ahmad et al., 2016). This method solves the multicollinearity problem by using appropriate lags for the impulses (Shin et al., 2014). The asymmetric error correction model under NARDL is specified as follows:

$$
\begin{aligned}
\Delta Y_t = {}& \alpha + \rho Y_{t-1} + \delta_1^+ (MKG)_{t-1}^+ + \delta_2^- (MKG)_{t-1}^- + \delta_3^+ (FR\&D)_{t-1}^+ + \\
& \delta_4^- (FR\&D)_{t-1}^- + \delta_5^+ (HR)_{t-1}^+ + \delta_6^- (HR)_{t-1}^- + \delta_7^+ (K)_{t-1}^+ + \\
& \delta_8^- (K)^- + \delta_9^+ (L)_{t-1}^+ + \delta_{10}^- (L)_{t-1}^- + \sum_{i=1}^m \alpha_1 \Delta Y_{t-i} + \\
& \sum_{i=0}^m \alpha_2 \Delta (MKG)_{t-i}^+ + \sum_{i=0}^m \alpha_3 \Delta (MKG)_{t-i}^- + \\
& \sum_{i=0}^m \alpha_4 \Delta (FR\&D)_{t-i}^+ + \sum_{i=0}^m \alpha_5 \Delta (FR\&D)_{t-i}^- + \\
& \sum_{i=0}^m \alpha_6 \Delta (HR)_{t-i}^+ + \sum_{i=0}^m \alpha_7 \Delta (HR)_{t-i}^- \sum_{i=0}^m \alpha_8 \Delta (K)_{t-i}^+ + \\
& \sum_{i=0}^m \alpha_9 \Delta (K)_{t-i}^- \sum_{i=0}^m \alpha_{10} \Delta (L)_{t-i}^+ + \sum_{i=0}^m \alpha_{11} \Delta (L)_{t-i}^- + \mu_t
\end{aligned}
\tag{4}
$$

In this equation, α_I refers to short-run coefficients and δ refers to long-run coefficients, with i = 1…11. The short-run analysis reveals the immediate effect of changes in the autonomous variables on the response variable. The long-run analysis demonstrates the time and speed of the adjustments of the exogenous variables toward the equilibrium level. We apply the Wald test for long-term asymmetry (δ = δ̆ = δ) and short-run asymmetry (α = ᾰ = α) checks for all impulses. Y_t represents economic growth, MKG_t denotes the capital goods import intensity, $FR\&D_t$ denotes foreign R&D capital stock, HR_t denotes human resources, and K_t and L_t represent capital and the employed labor force, respectively. M represents the optimal lag length for Y_t and autonomous variables (MKG_t, $FR\&D_t$, HR_t, K_t, and L_t) as specified by the Akaike information criterion (AIC).

To assess the impact of increases and decreases in the autonomous variables, they are decomposed into negative and positive partial sums:

$$
x_t^+ = \sum_{i=1}^m \Delta x_i^+ + \sum_{i=1}^m \max(\Delta x_i, 0)
\tag{5}
$$

$$
x_t^- = \sum_{i=1}^m \Delta x_i^- + \sum_{i=1}^m \min(\Delta x_i, 0)
\tag{6}
$$

where x_t denotes MKG_t, $FR\&D_t$, HR_t, K_t, L_t. For an asymmetric long-term co-integration check, Shin et al. (2014) have developed a joint test for all lagged

independent levels of variables—the bounds test. We use the F-statistic proposed by Pesaran et al. (2001) for short-run and long-run co-integration evaluation. The F-statistic tests the null hypothesis of $\delta = \delta = \delta = 0$. If the null hypothesis of no co-integration is rejected, then the F test suggests a long-run relationship among the variables. Before estimating the model, the augmented Dickey-Fuller (ADF), Phillips Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests are applied to examine the stationarity status of the impulses.

4.   Results and Discussion

4.1. *Descriptive Statistics*

The descriptive analysis is given in Table 1. The results show that imports of capital goods are more volatile than FDI and external R&D capital stock. Gross fixed capital formation and education levels are about equally volatile, showing the low-capital deepening of Pakistan's economy. Labor is the least volatile, showing relative stability over the whole sample. Furthermore, the skewness and Jarque-Bera statistics show the asymmetric and non-normal distribution of the data series, which is why asymmetric methods and analysis have been applied.

Table 1: Descriptive Statistics

Variable	Mean	Median	Max.	Min.	SD	Skewness	Kurtosis	Jarque B.	Probability
Yt	6.50	6.30	7.30	5.81	0.51	0.28	1.54	3.96	0.14
K	13.41	13.43	15.68	11.00	1.50	-0.07	1.69	2.82	0.24
L	3.67	3.62	4.12	3.22	0.31	0.11	1.46	3.91	0.14
MKG	31.82	32.00	42.00	23.00	4.98	0.01	2.29	0.81	0.67
FR&D	8.08	8.24	8.61	5.79	0.58	-2.52	9282	105.58	0.00
EDU	13.31	13.30	14.73	11.66	1.05	-0.16	1.647	3.14	0.21
FDI	0.01	0.01	0.04	0.00	0.01	2.21	7.48	64.51	0.00

Note: K, L, MKG, FR&D, HR, and FDI represent gross fixed capital formation, employed labor force, imports of machinery and capital goods, foreign R&D capital, human capital, and foreign direct investment, respectively.

4.2. *Econometric Results*

To ensure the absence of any series integrated of order 2 or I(2), the stationarity properties of the variables are checked. A unit root analysis is needed to confirm the order of integration and analyze the co-integration among all the determinants using the NARDL technique. The augmented Dickey-Fuller (Dickey & Fuller, 1979), Phillips Perron (Phillips & Perron,

1988) and Kwiatkowski et al. (1992) stationarity tests are applied and their results are reported in Table 2. The empirical evidence shows that all variables are stationary at the first difference with the intercept and trend, except for gross fixed capital formation and FDI. Neither contains a unit root at level with the intercept and trend. The PP unit root test gives a similar empirical evidence for all variables. The KPSS test generates a different result.

Table 2: Results of Unit Root Tests (without structural break)

Variables	ADF		PP		KPSS	
	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.
Y	2.371	5.579***	2.458	5.564***	0.151***	0.163***
L	1.576	6.338***	1.586	6.338***	0.1236***	0.6181***
K	5.455***	6.549***	5.454***	29.408***	.0740***	0.3037
MKG	3.013	3.444*	2.868	4.544***	0.068***	0.0518***
FR&D	2.950	5.812***	7.320***	5.813***	0.176***	0.173***
FDI	3.071**	4.116**	1.848	3.944***	0.1097***	0.040***
HR	2.109	6.401***	2.185	6.438***	0.109***	0.075***

Note: *, **, and *** indicate level of significance at 10%, 5% and 1%, respectively.
K, L, MKG, FR&D, HR, and FDI represent gross fixed capital formation, employed labor force, imports of machinery and capital goods, foreign R&D capital, human capital, and foreign direct investment, respectively.

The bounds test results for co-integration are reported in Table 3. At the first difference, all impulses are stationary. Accordingly, we apply the NARDL bounds testing method to check for asymmetric co-integration among the variables. Co-integration analysis is sensitive to the lag length selection for the model. We follow the SIC for this model and use one lag for all variables. The value of the F-statistic shows long-run co-integration as it is greater than the lower bound and upper bound values of the F-statistic at the 10, 5 and 1 percent significance levels. The results in Table 3 indicate that all the variables have a significant long-run relationship with Pakistan's GDP per capita.

Table 3: Bounds Test for Co-integration

Model specification	F-statistic	@ 10% level of significance		@ 5% level of significance		@ 5% level of significance		Conclusion
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
Linear	5.005	2.12	3.23	2.45	3.61	3.15	4.43	Co-integration
Nonlinear	4.358	1.83	2.94	2.06	3.24	2.54	3.86	Co-integration

The short-run results of the NARDL model in Table 4 reveal that negative human capital shocks are significant in the short run and show that a decrease in human capital in any mode, such as human capital flight, has a nonlinear asymmetric association with economic growth. In comparison, its positive shocks have an insignificant impact on economic growth due to low-quality education, which is incompatible with functioning as absorptive capacity for foreign technological knowledge spillovers. This finding is supported by Mayer (2001), who shows that education and skills in terms of quality are incompatible with and inadequate for the use of technologically specialized imported machinery by the labor force in LDCs.

Likewise, the negative shock of machinery and capital goods imports has an asymmetric and significant impact on per capita GDP. However, the negative shock of foreign R&D capital stock has a significant symmetric relationship with per capita GDP. A decrease in foreign R&D capital stock negatively affects economic growth because of low absorptive capacity and lack of essential prerequisite investment and measurements, i.e., financial deepening, infrastructure quality and political stability. This symmetry of economic growth and foreign R&D capital stock is because the absorptive capacity is at less-than-threshold level. Without a minimum threshold level of human resources, domestic firms cannot use technology transformation via FDI and other channels (Taylor & Smith, 2007).

Table 4: NARDL Model Short-run Results

Dependent Variable: Per Capita GDP			
Variables	**Coefficients**	**Standard Error**	**t- Statistics**
$\Delta K\_$	0.087308	0.026119	3.342675***
$\Delta K+$	0.401571	0.089138	4.505075***
$\Delta L\_$	-0.811383	0.942318	-0.861050
$\Delta L+$	0.977828	0.425732	2.296816**
$\Delta HR\_$	0.523241	0.232407	2.251396**
$\Delta HR+$	-0.052198	0.099877	-0.522623
$\Delta MKG\_$	0.008189	0.003370	2.430088**
$\Delta MKG+$	0.006380	0.006285	1.015140
$\Delta FR\&D\_$	-0.000084	0.000029	-2.848862*
$\Delta FR\&D+$	0.000006	0.000029	0.218622
$\Delta ECMt-1$	-0.877004	0.160788	-5.454410***

Note: *, **, *** indicate significance levels of 10%, 5% and 1%, respectively.
K, L, MKG, FR&D, and HR represent gross fixed capital formation, employed labor force, imports of machinery and capital goods, foreign R&D capital and human capital, respectively. ECM represents the error correction model.

The positive shocks of import intensity and foreign R&D capital stock show that the associations of these variables with economic growth are symmetric. Our results are consistent with the empirical literature, which shows that foreign spillovers obtained by imports of capital and technology-embodied imports and bilateral trade with advanced countries modify the domestic production function along with capital accumulation and explain Solow's residual growth (Œe et al., 2009). The error correction coefficient (ECMt−1) confirms that all the impulses of this model go together in the long run. The coefficient of the error correction term is −0.87 percent, which confirms that the model will adjust from short-run disturbance to long-term equilibrium at an 87 percent speed of adjustment per year.

The long-run results in Table 5 show that the positive shock of imports of capital goods—including machinery, capital and transportation equipment—has a positive impact on Pakistan's per capita GDP. Imports of capital goods have a symmetric association with economic growth. An increase in the import of capital has a significant positive relationship with economic growth, which is consistent with the findings of Coe et al. (1997) and Coe and Helpman (1995). Capital intensity is very important for the industrialization of developing countries as it increases the domestic value-addition process and international competition by altering the production function and upgrading labor force skills. Furthermore, it paves the way for FDI by increasing the confidence and incentives of foreign investors and transferring foreign technology to the LDC (Romer, 1990). Foreign R&D capital stock has an asymmetric association with economic growth as its positive shock has an inverse impact on economic growth in Pakistan.

Table 5: NARDL Model Long-run Results

Dependent Variable: Per capita GDP			
Variables	Coefficients	Standard Error	t- Statistics
K_	0.547415	0.143503	3.814657***
K+	0.411235	0.119544	3.440029***
L-	2.986925	1.114423	2.680244***
L+	1.462337	0.498686	2.932379***
HR_	0.596623	0.307948	1.937414*
HR+	-0.059519	0.117007	-0.508678
MKG_	0.009337	0.004001	2.333691**
MKG+	0.017981	0.006493	2.769066*
FR&D_	-0.000095	0.000031	-3.050206**
FR&D+	-0.000178	0.000048	-3.730430***

Note: *, **, *** indicate levels of significance at 10%, 5% and 1%, respectively.
K, L, MKG, FR&D, and HR represent gross fixed capital formation, employed labor force, imports of machinery and capital goods, foreign R&D capital and human capital, respectively.

Our results are aligned with the findings of Liu and Fan (2020). They find that international technological spillovers have a nonlinear association with economic growth, that is, various absorptive capacity factors maximize spillover effects when they are within two thresholds. This is a channel for the transfer of international technological spillovers. However, the effect of this spillover on the productivity of different countries may vary according to their national attributes and efficiencies. More specifically, technological spillovers generally crowd out the independent innovation capability of developing countries, but have a 'crowding-in effect' on developed countries.

The threshold level effect suggested by Borensztein et al. (1998) leads to a specific level of national absorptive capacity and capabilities that can be positively influenced by technology transmission. The positive effect of external technology can be obtained after a predetermined threshold level as foreign and domestic enterprises' shares (Cantwell, 1989). However, Pakistan does not have adequate threshold levels of different absorptive capacities, and so foreign R&D capital stock has significant negative links with economic growth. Developing countries with more open economies and where a greater fraction of imports comes from developed countries rich in R&D capital can capture more technological knowledge from abroad. Nevertheless, the relative absorption of these spillovers depends on domestic attributes such as human capital, infrastructure and openness (Coe & Helpman, 1995; Coe et al., 1997).

The results of the Wald test for asymmetric relationships are given in Table 6. The results show significant F values for both short-run and long-run asymmetry, which confirms the presence of an asymmetric relationship.

Table 6: Wald Test of Asymmetric Associations

Null Hypothesis	F-statistic	Probability
HYP2: for long-run asymmetry	5.9414	0.0004
HYP3: for short-run asymmetry	6.9414	0.005

The results of the Ramsey RESET test, LM test for autocorrelation, Harvey test for heteroskedasticity and Jarque–Bera normality test are given in Table 7. The results of all these diagnostic tests confirm that the model is specified correctly and has no autocorrelation or heteroskedasticity issues. The result of the Jarque–Bera normality test confirms that the model is normal. Similarly, the analysis of CUSUM and CUSUM squares given in Figures 1 and 2 reveals that the model is, overall, stable in the long run.

Table 7: Diagnostic Tests

Diagnostic tests	F-statistic	Probability
Ramsey RESET test for model specification	0.604563	0.4469
LM autocorrelation test	1.444765	0.2633
Harvey heteroskedasticity test	1.843985	0.0995
Jarque-Bera normality test	0.8341	0.6589

Figure 1: CUSUM

Figure 1: CUSUM

Figure 2: CUSUM Squares
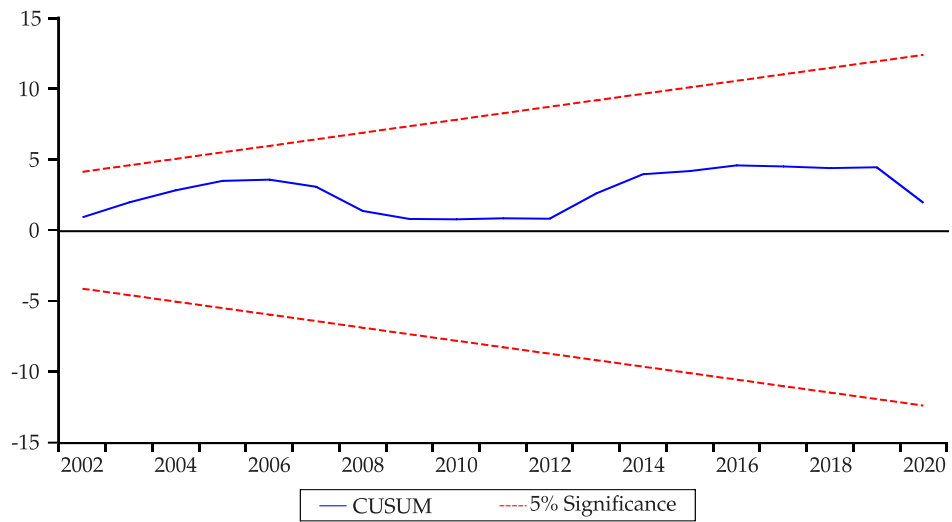
Figure 2: CUSUM Squares
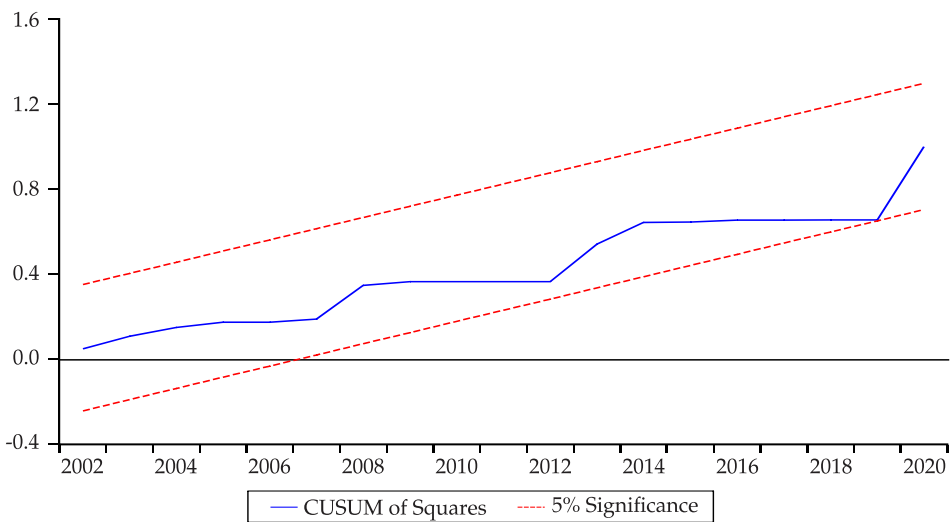
5. Conclusion

This study investigates the asymmetric impact of capital imports and foreign R&D capital stock on Pakistan's economic growth, augmented by human capital as a measure of absorptive capacity, during the period 1982–2020. The ADF, PP and KPSS unit root tests have been used to check the stationarity status of the impulses. The descriptive statistics confirm the nonlinearity of the data. Our theoretical and empirical analyses explore the asymmetric relationships among the model variables. We apply a NARDL model to estimate long-run asymmetries in the variables. The ECM for checking short-run to long-run adjustment has a value of 87 percent and shows the speed at which Pakistan's economic growth returns to equilibrium after a change in explanatory variables.

The results of the bounds test confirm the presence of nonlinear co-integration in the explanatory variables and Pakistan's per capita output growth. Human capital has an asymmetric impact on output growth because of low spending in the education sector. The results reveal that the magnitude of a negative shock is greater than the positive shock of human capital because of the low literacy rate. In Pakistan, several factors are responsible for the low literacy rate, including archaic teaching methods, traditional curricula, staff shortages, poverty, regressive government policies, inaccessibility of schools and low education budgets.

The empirical research considers human capital development a measure of absorptive capacity for foreign technology (Gupta et al., 2022). Unfortunately, Pakistan's knowledge-based learning is inadequate and has hindered the spillover impact of multinational companies on its economic development. The association between technological spillover determinants and economic growth seems asymmetric. However, the magnitude of positive shocks of both determinants is greater than negative shocks, which reveals the relative importance of these factors for promoting growth. The impact of imports of machinery and technological goods is positive on growth in both the short and long run. At the same time, the impact of external R&D capital stock is symmetric in the short run but becomes negative in the long run. Inadequate absorption capabilities and a less-than-threshold level of human capital are responsible for the negative and insignificant effects of international technological knowledge. Furthermore, the CUSUM and CUSUM square graphs confirm the stability of the model over the sample period.

Based on our empirical findings, we suggest that Pakistan must enhance investment in human development by increasing the share of the education sector's budget. The literacy rate and quality of education can only be promoted by upgrading curricula, improving teaching methods and discipline, allocating more funds for education, specifically for skilled education, and ensuring the accessibility of schools for all. Online blended systems of education delivery could be introduced to reap the benefits of modern technology. These measures are essential to achieve an adequate threshold level of human capital. Trade policy should be biased toward capital-intensive imports rather than luxury or consumer goods. Reframing Pakistan's trade policy could help capture the R&D capital stock spillover of developed countries. By investing in proper infrastructure, research environments, incentives and institutions, the domestic R&D capital stock could also be better developed in Pakistan.

Previous efforts to assess the asymmetric relationship between foreign technology-embodied capital imports and domestic technological breakthroughs of advanced trading partners on the economic growth of developing countries have been limited by the unavailability of relevant data. Therefore, the analysis could be extended to panel research by including developing and low-income countries, depending on the availability of the data. Our analysis is also restricted to national productivity because of data availability. It could also be extended to other sectors of the economy, such as the industrial or agricultural sectors, if sector-level data is available. More efforts are required to explore the association and determinants of industrial and agricultural sector productivity, which will likely be a significant future research contribution.

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Brand Equity Creation through a Moderated Mediation Model in the Luxury Brand Industry

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Abstract: *This research gauges the role of brand experience and perceived social media marketing activities in the creation of consumer-based brand equity using a stimulus-organism-response model. The data was collected through a structured questionnaire focused on luxury fashion brands. The sample, consisting of 243 usable responses, was analyzed using structural equation modelling in Smart PLS4. Our results show that perceived social media activities play a vital role in the creation of brand equity. Brand experience partially mediates the association between consumer-based brand equity and perceived social media marketing. Interestingly, high brand trust contributes to higher consumer-based brand equity. This study is adds value to the literature by focusing on the role of perceived social media marketing activities in the creation of consumer-based brand equity through a second-stage approach to moderated mediation using brand experience and brand trust. The study also has valuable managerial implications that could help businesses enhance their consumer-based brand equity. Luxury fashion brands should maximize customer experience through social media activities and engagement. Fashion brands should also invest in personalized recommendation engines on social media platforms to improve consumer experience.*

Keywords: Perceived social media activities, brand experience, brand trust, consumer-based brand equity, moderated mediation.

JEL Classification: M31, M37, D22.

Brand Equity Creation through a Moderated Mediation Model in the Luxury Brand Industry

1. Introduction

Technology has created a high-engagement environment for consumers, predominantly social media-based activities (Ananda et al., 2019; Bazi et al., 2023). Reportedly, Facebook has 2.6 billion active users and there are over 1 billion active users on Instagram and WhatsApp (Tankovska, 2021). A recent report revealed that social networking accounts for 23 percent of the total time spent online (Nielson, 2019). This finding supports the notion that social media platforms are used as effective communication channels by businesses. Marketing communications are increasingly disseminated on social media to build brand awareness and brand image, which boost sales revenue (Bruhn et al. 2012; Kunja & Acharyulu, 2018). It has also improved interactivity by providing two-way communication (Verhagen et al., 2015).

An online brand community is defined as an 'aggregation of self-selected people who share similar interests and interact with each other about a brand through computer-mediated communications' (Baldus et al., 2015). These communities not only promote and advertise the brand but also manage the relationship by providing an experience (Hollebeek et al., 2014). Social media marketing activities (SMMA) are an extension of digital marketing communication (Tuten, 2023). SMMA facilitate and closely monitor customer interaction and communication with the brands and other consumers. Kim and Ko (2012) classify five key forces that characterize SMMA: trendiness, interaction, customization, entertainment, and word-of-mouth (see also Yadav & Rahman, 2017).

Significant growth rates in the luxury brand market have attracted the attention of practitioners and academics. According to McKinsey (2018), digital technology has influenced the global luxury brand market by 80 percent, and luxury brands' online transactions are likely to reach 25 percent of total sales by 2025. Online luxury brand sales made €49 billion in 2020, compared to €33 billion in 2019 (D'Arpizio et al., 2021). Today's consumers are thus significantly impacted by online information about brands and their interactions and communication on social platforms (Kim et al., 2012). The COVID-19 pandemic has also enhanced customers' social media marketing behaviors in US markets (Mason et al., 2021). Social media marketing activities are significant for luxury fashion brands in developing customer behavioral engagement and creating a brand experience (Bazi et al., 2023).

The literature shows that social media has an important role in modelling economic decision-making (Ausat, 2023). Past studies conclude that existing customer spending habits can be affected by social media messages (Goh et al., 2013; Kumar et al., 2016) and help generate revenues (Phan et al., 2011). Brand loyalty is strengthened when customers perceive the SMMA of a particular brand positively (Ismail, 2017). Hence, effective SMMA plays a critical role in shaping consumer-based brand equity (CBBE), which consists of brand loyalty, perceived quality and brand awareness (Ibrahim et al., 2021). Beig and Khan (2018) reveal that regular social media interaction enhances brand experience for followers. Furthermore, Altaf et al. (2017) and Koay et al. (2020) find that a good brand experience can lead to stronger CBBE.

This study suggests that perceived social media marketing activities (PSMMA) influence consumer brand experience (BE) first, leading to CBBE creation. We follow a stimulus-organism-response (S-O-R) model and argue that the PSMMA and CBBE relationship is mediated by brand experience. We address the following research questions: Do perceived social media activities significantly affect CBBE? Does brand experience mediate the relationship between PSMMA and CBBE? Does trust moderate the relationship between brand experience and CBBE?

In doing so, we contribute to the literature as follows. First, we use PSMMA, brand experience, and CBBE as multidimensional (reflective–formative) higher-order constructs. Second, using the S-O-R model, we examine trust as a moderating variable affecting brand experience and consumer brand equity relationships. Previous studies have examined social media activities with different moderating factors (Alsaad et al., 2017; See-To & Ho, 2014). Alsaad et al. (2017) find that trust moderates the online context where the literature is not well established. Our research studies the construct of trust and its role in strengthening CBBE. Third, we test the moderated-mediation relationship between trust and brand experience and its impact on CBBE. To the best of our understanding, this effect has not yet been explored. We aim to establish how social media activities are linked to CBBE through the interaction between brand trust (BT) and brand experience. Lastly, for more conclusive results, we focus on the luxury fashion brands market, as proposed by Koay et al. (2020).

The paper is organized as follows. Section 2 presents the theoretical background to develop the study's hypotheses. Section 3 presents the variable measurement and methodology. Section 4 provides the results of

the proposed hypotheses. Section 5 discusses the results along with their implications and future research directions.

2. Theoretical Background

The foundation of our research is the S-O-R model, in which the environmental characteristics (stimuli) activate the inner state of the consumer (organism) and cause them to engage in specific behaviors (response) (Jacoby, 2002; Mehrabian & Russell, 1974). We propose that PSMMA, a multidimensional construct, acts as a stimulus. It affects consumers' exposure to a brand's social media platform. The forces of social media activities (interaction, customization, entertainment, trendiness, and word-of-mouth) act as stimuli, evoking the inner state of the consumer through brand trust and brand experience.

Brand experience and brand trust are treated as the organism in the S-O-R model and refer to the emotional and rational state of consumer on experiencing PSMMA (Koay et al., 2020). Lastly, CBBE acts as the response. The stimulus and organism lead to a response—creating CBBE. The model was initially established in the retail industry. Later, it was utilized to study e-retailing (Animesh et al., 2011; Jiang et al., 2010; Koay et al., 2020; Seo & Park, 2018). The S-O-R model is illustrated in Figure 1.

2.1. PSMMA and CBBE

Brand equity is a key issue in marketing. Keller (1993) defines brand equity as 'the differential effect of brand knowledge on consumer response to the marketing of the brand'. Brand equity is measured and conceptualized at the individual level (Leone et al., 2006). Brand equity is a multi-faceted concept (brand associations, brand awareness, brand loyalty and perceived quality) (Aaker, 1991). It creates value for the customers and the company.

In the technological era, companies develop strong relationships and associations through social media platforms. Social media marketing activities include creating, communicating and providing market offerings through which brands want to facilitate and improve interactions with stakeholders, providing them with personalized suggestions and enhancing customer relationships (Chen & Qasim, 2020; Yadav & Rahman, 2017).

PSMMA refers to "how consumers perceive company or brand engagement in various social media marketing activities" (Koay et al., 2020, p.55). It does not limit social media to Facebook but also represents all other

platforms (websites, user reviews, forums and media that facilitate interaction, collaborative work and content sharing) where consumers can interact (Richter & Koch, 2008). Thus, companies use entertainment, trendiness, word-of-mouth interactivity and customization to promote their brand, which enhances awareness and brand loyalty (Lim et al., 2020; Nobar et al., 2020; Yu & Yuan, 2019).

Social media has gained immense popularity among brands and consumers. A study by Agarwal and Gulla (2022) on the e-commerce brand Amazon evaluates the significant effect of social media on brand equity. Wei et al. (2023) show that the dimensions of social media activities have an impact on CBBE. PSMMA has great potential to magnify CBBE in the case of Chinese consumers (Chen & Qasim, 2020). Based on these findings, we hypothesize:

Hypothesis 1: PSMMA has a significant positive impact on CBBE.

2.2. PSMMA and BE

Brand experience is denoted as the 'subjective internal consumer responses and behavioral responses evoked by brand-related stimuli that are part of a brand's design, and identity, packaging, communications, and environments' (Brakus et al., 2009). We study brand experience as a mediator between PSMMA and CBBE. Social media activities help create a brand experience (Chen & Qasim, 2020; Koay et al., 2020). Using social media marketing, marketers develop personalization, trendiness, word of mouth, interactivity, and informativeness, which provides a better customer experience (Appiah et al., 2019). Thus, we propose the following hypothesis:

Hypothesis 2: PSMMA has a significant positive impact on brand experience.

2.3. Brand Experience and Consumer-based Brand Equity

Previous literature has concluded that a favorable brand experience creates positive brand equity (Altaf et al., 2017; Farzin et al., 2023; Xie et al., 2017). Studies show that PSMMA can have indirect and direct effects on improving brand experience. Brand experience has a mediating effect on different characteristics of CBBE (Chen & Qasim, 2020; Zollo et al., 2020). Brand experience has a positive effect on brand trust, brand loyalty and brand satisfaction (Sahin et al., 2011). Brand experience enriches the quality-of-brand relationship, thereby supporting customer citizenship behavior

(Xie et al., 2017). However, there is limited literature on the mediating impact of brand experience between PSMMA and CBBE. Hence, we postulate the following hypotheses:

Hypothesis 3: Brand experience has a significant positive influence on CBBE.

Hypothesis 4: Brand experience mediates the relationship between PSMMA and CBBE.

2.4. Trust as a Moderator

Trust is an important construct in forming long-term associations (Pennanen et al., 2007). Brand trust is defined as 'feeling secure when interacting with a brand based on the perception that the brand is reliable and meets the consumer's interests' (Delgado-Ballester & Munuera-Aleman, 2001). Brand experience is a critical source of brand trust because it reflects thoughts that are accepted with greater assurance (Krishnan, 1996). Therefore, when consumers perceive higher trust in a certain brand, their brand equity towards it will also be higher (Sanchez-Franco et al., 2009). Thus, we hypothesize that:

Hypothesis 5: Trust moderates the relationship between brand experience and consumer-based brand equity, such that the relationship is stronger when trust is high.

Figure 1: Theoretical Framework
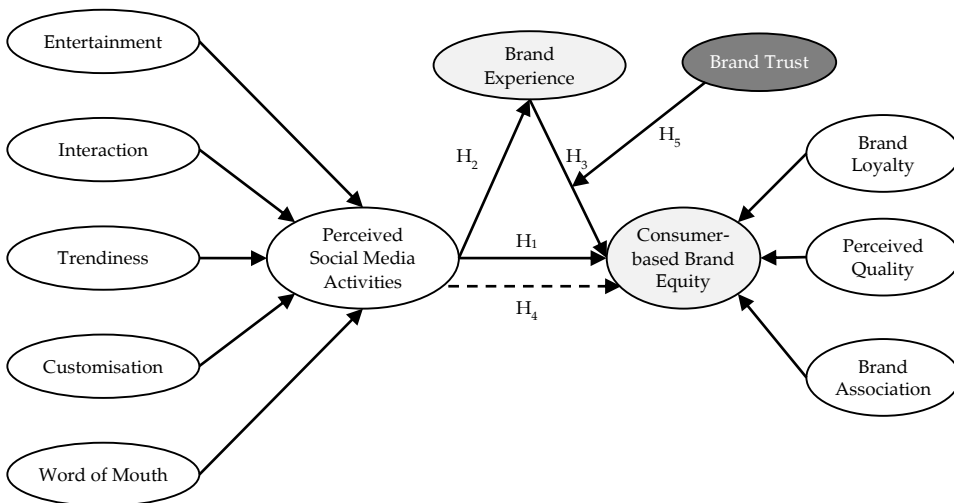
3. Methodology

3.1. Sample and Data Collection

Purposive sampling was used to collect consumer data through an online questionnaire that required consumers to follow a luxury fashion brand page on any online platform and interact with the brand. This sampling technique is applicable to empirical research in a specific market or context, and it enabled us to select the sample in line with the purpose of the research (Bell et al., 2018). The target sample comprised Pakistani luxury brand consumers who had been exposed to some form of social media marketing activities. The data was collected for PSMMA, brand experience, brand trust, and CBBE. An online survey was posted on different online forums and communities.

The survey had three sections: a cover letter, demographic information and a description of the research instrument. The objective of the study was specified in the cover letter. Respondents had to specify a luxury fashion brand they had followed on social media platforms (Ismail, 2017). Participants were assured that their participation was voluntary (without financial reward), confidential and anonymous. Of the 264 questionnaires, 243 were useable (a return rate of 92 percent). Lastly, basic demographic information related to gender, marital status and education was collected, as shown in Table 1.

Table 1: Demographic Statistics

Demographics (Average)	Statistics
Age Bracket	19–25 years
Education	16 years
Gender	65% females, 35% males
Marital Status	63% married, 37% single
Social Media Brand	30% Elan, 29% Khaadi, 20% Sana Safinaz, 6% Bareeze Men, others 15%

3.2. Measurement of Variables

PSMMA was measured using an 11-item scale instrument that included five first-order dimensions (Polites et al., 2012): entertainment, customization, interaction, trendiness, and word of mouth. A five-point Likert scale, in which 1 indicated 'strongly disagree' and 5 indicated 'strongly agree', was used to measure the response.

A nine-item scale adapted from Morgan-Thomas and Veloutsou (2013) was used to measure brand experience. A ten-item instrument was used to measure CBBE. This construct included three lower-order reflective constructs: brand awareness/association was measured using a five-item scale, brand loyalty was measured using a two-item scale adapted from Yoo and Donthu (2001), and perceived quality was measured using four items from Spry et al. (2011). Brand trust was quantified using a five-item scale adapted from Han et al. (2015) and Beck and Prügl (2018).

4. Results

4.1. Common Method Variance and Indicator of Multicollinearity

When a respondent fills out a questionnaire at a given point in time, it can indicate common method variance (CMV) (Podsakoff & Organ, 1986). In order to determine CMV we use the measured latent marker variable (MLMV) approach (Chin et al., 2013). A marker variable is a theoretically unrelated construct of the variables and framework under study. It is collected while conducting the survey. The measured marker variable is then applied to the independent variables and dependent variables, in which R^2 values and beta values are compared before the measured marker and after the measured marker to confirm that they are not significantly different.

Table 2 shows the analysis of CMV findings after the latent variable scores for the second-order model were computed. The test indicates that the dataset does not suffer from CMV (Kock, 2015). The variance inflation factor (VIF) values are obtained to evaluate the multicollinearity of the constructs (Fornell & Bookstein, 1982). Multicollinearity is not a problem if the VIF's value is less than 5 (Hair et al., 2016). The VIF values for each indicator in the study are less than 5.

Table 2: CMV using the Marker Variable Method

Dependent Variable	R^2 without Marker	R^2 with Marker	β without Marker	β with Marker
CBBE	0.337	0.337	0.441	0.442
BE	0.288	0.294	0.537	0.537
CBBE	0.337	0.337	0.209	0.208

4.2. Measurement Model

We employ a partial least squares-based structural equation modelling (PLS-SEM) method. Table 3 gives the results of our

measurement model. The factor loadings, average variance extracted (AVE), composite reliability and discriminant validity for the reflective constructs are reported in the table. We evaluate the measurement model of first-order reflective constructs by analyzing the factor loadings. All the loadings are statistically significant and above 0.5. We apply the bootstrapping approach with 2,000 subsamples to calculate the t-values (Henseler et al., 2009).

The coefficients of standardized factor loadings of the first-order reflective constructs are greater than 0.5 (t > 1.96). The average variance extracted (AVE) meets the 0.5 benchmark or higher which signifies convergent validity for the reflective constructs (Hair et al., 2016). The internal consistency of the reflective constructs (composite reliability) is greater than 0.7. The discriminant validity is measured through the heterotrait-monotrait (HTMT) ratio of the correlation criteria, as shown in Table 4. The HTMT values are below 1, the predetermined benchmark (Henseler et al., 2015).

Table 3: First-order Measurement Model

Construct Statements	Standardized Loadings	Boot Sample t-value
Consumer-based brand equity (CBBE) (formative construct) (Spry et al., 2011; Yoo & Donthu, 2001)		
Brand loyalty (BL) (reflective construct) AVE= 0.509 CR=0.837		
BL 1	0.747***	15.108
BL 2	0.640***	12.094
BL 3	0.673***	13.497
Perceived quality (PQ) (reflective construct) AVE = 0.813 CR = 0.897		
PQ1	0.927***	28.112
PQ2	0.876***	44.499
Brand associations BA (reflective construct) AVE = 0.630 CR = 0.871		
BA 1	0.830***	27.637
BA 2	0.856***	29.017
BA 3	0.826***	19.738
BA 4	0.646***	9.878
Brand trust (BT) (reflective construct) (Beck & Prügl, 2018; Han et al., 2015) AVE = 0.587 CR = 0.876		
BT 1	0.661***	12.969
BT 2	0.821***	28.258
BT 3	0.827***	29.920
BT 4	0.789***	29.018
BT 5	0.722***	11.730

Construct Statements	Standardized Loadings	Boot Sample t-value
Brand experience (BE) (Morgan et al., 2013) AVE = 0.549 CR = 0.907		
BE 1	0.781***	28.434
BE 2	0.738***	20.544
BE 3	0.792***	26.142
BE 4	0.730***	18.723
BE 5	0.735***	23.225
BE 6	0.721***	19.711
BE 7	0.721***	20.250
BE 8	0.706***	18.724
Perceived social media activities PSMMA (formative construct) (Kim & Ko, 2012)		
Entertainment (E) (reflective construct) AVE = 0.777 CR = 0.874		
E 1	0.868***	28.112
E 2	0.895***	44.499
Interaction(I) (reflective construct) AVE = 0.543 CR = 0.778		
I 1	0.658***	4.116
I 2	0.686***	5.644
I 3	0.851***	9.126
Trendiness (T) (reflective construct) AVE = 0.667 CR = 0.808		
T 1	0.819***	13.775
T 2	0.827***	18.172

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, AVE > 0.5 signifies convergent validity, and CR > 0.7 signifies internal consistency.

Table 4: HTMT ratio of correlations

Factors	Brand Association	Brand Experience	Brand Loyalty	Brand Trust	Customization	Entertainment	Interaction	Perceived Quality	Trendiness	WOM
Brand Association										
Brand Experience	0.844									
Brand Loyalty	0.692	0.705								
Brand Trust	0.504	0.867	0.665							
Customization	0.114	0.335	0.317	0.206						
Entertainment	0.368	0.547	0.460	0.244	0.441					
Interaction	0.268	0.390	0.298	0.236	0.649	0.727				
Perceived Quality	0.677	0.685	0.748	0.698	0.063	0.343	0.334			
Trendiness	0.583	0.648	0.443	0.331	0.447	0.714	0.694	0.474		
Word of Mouth	0.378	0.619	0.654	0.372	0.691	0.647	0.540	0.127	0.6	N/A

4.3. Second-Order Measurement Model Assessment

A disjoint two-stage method is used in this study (Agarwal & Karahanna, 2000). The first-order model generates a new model. The scores of these latent variables are represented as the single-item weights for the respective second-order latent constructs. To establish high-order construct validity, the t-values (Peng & Lai, 2012), outer weights (Diamantopoulos & Winklhofer, 2001), and VIF (Cassel al., 1999) should be significant (Hair et al., 2016), otherwise, the outer loadings should be above 0.4. The VIF values indicate no multicollinearity because they are not greater than 3.3, and a few of the outer weights of the formative items are found to be insignificant as shown in Table 5. However, the theoretical significance of these indicators was preserved as shown by previous studies.

Table 5: Weights, t-values, loadings and VIF for Second-order Constructs

		Scale	Weights a	t-value b	Loadings	VIF
Consumer Based-Brand Equity	Brand Association		0.328	2.328***	0.777	1.615
	Brand Loyalty	Formative	0.704	4.734***	0.949	1.718
	Perceived Quality		0.111	0.53	0.697	1.69
Perceived Social Media Activities	Entertainment		0.374	3.336***	0.752	1.468
	Interaction		0.018	0.144	0.475	1.462
	Trendiness	Formative	0.367	3.19***	0.702	1.356
	Customization		0.009	0.08	0.488	1.45
	Word of Mouth		0.568	4.481***	0.836	1.478

Note: (a) Formative: Standardized beta weights (Diamantopoulos & Winklhofer, 2001)
(b) Formative: t-value > 1.96 (*) significant at 10% for a two-tailed test (Peng & Lai, 2012)
(c) Formative: VIF < 5 (Cassel et al., 1999).

4.4. Structural Model

Table 6 presents the findings of the direct effects, reporting the effect sizes ($f2$) (Sullivan & Feinn, 2012). The effect size appraisal should follow the standards set by Cohen (1988) and record values of 0.35, 0.15 and 0.02 for the large, medium and small effects, respectively.

The results support hypothesis 1. The relationship between PSMMA and CBBE is significant and positive, with a medium-effect size ($\beta = 0.303$, $p = 0.000$, $f2 = 0.100$). Our findings also support hypothesis 2. The association between PSMMA and brand experience is significant, with a positive coefficient and large-effect size ($\beta = 0.552$, $p = 0.000$, $f2 = 0.453$). Similarly, hypothesis 3 is supported by our results. The relationship

between BE and CBBE is significant and has a medium-effect size (β= 0.376, p = 0.000, f2 = 0.153).

The coefficient of determination of PSMMA and brand experience with CBBE is R^2 = 0.353. The coefficient of determination of PSMMA and brand experience is R^2 = 0.301. This explains the variance in the endogenous variables that is explained by the exogenous variables. The Q2 values are above 0, suggesting that each exogenous variable has predictive relevance for both endogenous latent variables. All the relationships show strong values for power tests (i.e., 0.999 or above).

The mediating impact of brand experience on the association between PSMMA and CBBE is tested by the total effect, i.e., direct and indirect effects. Consequently, the individual indirect effect is produced by bootstrapping (i.e., resampling of 5,000 samples) as shown in Table 7. The total effect of PSMMA on CBBE is significant (β= 0.511, p = 0.000). With the presence of brand experience (the mediating variable), the impact of PSMMA on CBBE is significant (β= 0.303, p = 0.000). The indirect effect of PSMMA on CBBE through brand experience is also significant (β= 0.207, p = 0.000). This finding shows that the relationship between PSMMA and CBBE is partially mediated by brand experience. Thus, we can accept hypothesis 4.

Finally, the product indicator approach is used to test the moderation of brand trust to generate the interaction term (brand experience * brand trust) (Hayes, 2017), as shown in Table 6. The bootstrapping method is used to test the significance of the interaction term for brand experience. Accordingly, hypothesis 5 is accepted (β= 0.131, p = 0.00, f2 =0.056), showing that brand trust moderates the association between PSMMA and brand experience. This finding supports the argument that the indirect effect of PSMMA on CBBE via brand experience varies by brand trust, as the confidence intervals of the moderated mediation index include a value of 0 (Hayes, 2017, 2015).

Table 6: Results of the Direct Effects of PSMMA on BE and CBBE

Hypotheses	Relationships	Path Coefficients	p-value	f2	R2	Q2
H1	PSMMA --> CBBE	0.303***	0.000	0.100	0.353***	0.221
H2	PSMMA --> BE	0.552***	0.000	0.453***	0.301***	0.154
H3	BE --> CBBE	0.376***	0.000	0.153***	0.353***	0.221
H5	BE * BT --> CBBE	0.131***	0.000	0.056*	0.505***	0.324

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 7: Results of Mediation Analysis

Total Effect PSMMA→CBBE			Direct Effect PSMMA→CBBE			Indirect Effect (H4) PSMMA→BE→CBBE		
Coefficient	p-value	t-value	Coefficient	p-value	t-value	Coefficient	p-value	t-value
0.511	0.000	7.375***	0.303	0.000	3.093***	0.207	0.000	4.350***

Note: *p<0.1, **p<0.05, ***p<0.01

5. Discussion and Findings

This research extends the prevailing research by focusing on the significance of PSMMA in the creation of CBBE through the second-stage approach of moderated mediation, using brand experience and brand trust. The theoretical model highlights the significance of social media activities for luxury fashion brand marketers in an emerging market, Pakistan. This research supports the relationship between PSMMA and CBBE. The study model confirms the S-O-R model. Social media activities through entertainment, trendiness, interaction, customization and word of mouth help stimulate customers' inner state, leading to positive outcomes (Chen & Lin, 2019; Ismail, 2017).

A possible explanation for the significant findings of hypothesis 1 is that, when luxury fashion brand marketers use social media, such as for interactive marketing campaigns, and informative and personalized recommendations, this builds the perception that the brand offers customers greater value. As a result, CBBE, including brand loyalty, brand association and perceived quality, is positively influenced. These findings are consistent with the literature (Koay et al., 2020; Sikandar & Ahmed, 2019). A plausible explanation for the significant findings of hypothesis 2 is that, with digital social media, marketing is more about experience than merely the 4 Ps. The trendiness and interactivity of social media activities lead to sensory marketing, which eventually builds up an overall experience for the consumer.

Hypothesis 3 shows that sensory marketing, which creates brand experience, leads to quality perception, loyalty and brand association (positive brand equity), which other studies have also established (Xie et al., 2017; Dwivedi, 2015). Hypothesis 4 shows that the relationship between PSMMA and brand equity exists because of brand experience. The findings of the mediation analysis align with those of Chen and Qasim (2020) and Zollo et al. (2020). The significant results of hypothesis 5 explain that for luxury brands, in the case of high brand trust, a better brand experience

will have an amplified effect on creating brand equity in the form of perceived quality, loyalty and association. These findings are similar to those of Sanchez-Franco et al. (2009).

Luxury brands symbolize high status and users are seen as part of an elite community (Nueno & Quelch, 1998). These luxury brands should strategically aim to promote the feeling of exclusivity and social interaction by providing a brand experience. Our empirical analysis shows that consumers' perceptions of SMMA lead to brand experience, which in turn leads to higher CBBE, including brand loyalty (Brakus et al., 2009), perceived quality and brand association. We discover that brand trust moderates the relationship between CBBE and brand experience, thus indicating that different levels of brand trust impact brand CBBE creation differently. Marketers could work on creating brand trust, which would be reflected in higher brand loyalty, association and perceived quality.

5.1. Managerial Implications

The changing dynamics of business–consumer interaction have allowed consumers to share their ideas on a given brand's social media platforms (Seo & Park, 2018). Thus, luxury fashion brands should focus on maximizing customer interaction and brand experience. This study supports the idea that brands should be actively involved in managing their social media pages. Luxury brands can engage digital agencies to use their expertise in keeping the audience involved. For example, brand pages with an element of entertainment help consumers better engage with the brand. This could be done by involving bloggers and vloggers in promoting the brand. Brands should also respond actively to every issue flagged by customers to prevent any unpleasant experiences. Furthermore, they should invest in customized recommendation engines to improve their experience. Social media websites act as lead platforms for triumphing brand awareness and marketing communication (Li et al., 2021).

These recommendations will help provide a more positive experience to customers. An effective social media marketing campaign would motivate customers to share experiences associated with the brand voluntarily, leading to positive word of mouth (Kim & Ko, 2012; Yadav & Rahman, 2017). Such social media marketing helps create a brand experience and improved CBBE, and this relationship can be further strengthened by high brand trust. Brands can build on trust by providing accurate information, fulfilling their promises and not compromising on quality, which leads to higher brand equity creation.

5.2. Future Research Directions

This study examines the effect of PSMMA on CBBE through the second-stage approach of moderated mediation using brand experience and brand trust. Our findings show that PSMMA play a significant role in forming brand equity. The findings of the mediation model show that brand experience partially mediates the association between PSMMA and CBBE. Moreover, high brand trust contributes to higher CBBE.

As researchers, we faced certain limitations. First, social media platforms were used generically. Using a specific platform might provide a better understanding of the relationships proposed, such as Facebook, Instagram, Twitter or YouTube. Future studies could also include other dimensions of brand equity (e.g., self-congruence and brand affect). Furthermore, this study could be replicated in other industries or sectors. We would recommend using longitudinal data in future research and testing other important mediators, for example, social media engagement and emotional brand attachment.

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Driving Customer Loyalty through Customer Satisfaction in Online Shopping: The Role of Brand Image, Price, Trust and Website Quality

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Abstract: *The relationship between brand image and loyalty in online shopping has gained significant attention in the marketing literature. Despite this attention, the specific path linking brand image to customer loyalty remains unclear. This study delves into the sequential and parallel mediations between brand image and customer loyalty, aiming to identify the effects of brand image, price, trust and website quality on customer loyalty through the mediation of customer satisfaction. Employing a parallel and sequential mediation model, this research addresses the practical implications for emerging e-commerce businesses. For data collection, an online questionnaire survey distributed to 120 respondents yielded a 65 percent response rate. The findings of the study affirm that brand image, price and trust positively influence customer satisfaction and loyalty, establishing direct and indirect relationships among these constructs. This study contributes to the validation of the proposed research model in the specific context of a developing country, i.e., Pakistan.*

Driving Customer Loyalty through Customer Satisfaction in Online Shopping: The Role of Brand Image, Price, Trust and Website Quality

1. Introduction

Consumer buying behavior has changed since the global COVID-19 pandemic (Bognar, 2022). The pandemic caused people to shift from in-store shopping to online shopping, resulting in a drastic increase in e-transactions and home delivery (Rout, 2022). As a result, online shopping has become a significant trend among consumers, making it easier for them to pay from home and obtain their purchase at their doorstep, which was necessary during the pandemic (Tantawi, 2023).

Additionally, the internet and web development have played fundamental roles in the domain of information and communication technology, making it easy for customers to shop online from among their favorite brands. Furthermore, online shopping has reformed the marketing strategies of many brands, which are now more focused on selling online and delivering products to customers' doorsteps. The brand's effort helps them satisfy the customer and at the same time retain them, which induces loyalty to the brand (Venkatakrishnan et al., 2023). A significant change has thus occurred in purchasing methods due to the pandemic. Online shopping has also played an essential role in the rapid growth of e-commerce (Huang, 2022).

Many businesses are adapting to new technologies and using e-commerce platforms to promote their products (Akram et al., 2022). A customer can decide what to buy at home by looking at and comparing the prices of different competitors' products (Fatima, 2022). The growth and success of a business can be identified by how well its customers are satisfied and how well they remain loyal. Satisfied, loyal customers increase a business's revenue and decrease the cost of acquiring new customers (Khan, 2022). Bilgihan (2016) points out that the profitability of a business is strongly linked to high customer retention in an online environment. Moreover, in the era of globalization, the demands on the business world are being reshaped by greater competitiveness. To overcome this barrier, they need to achieve customer satisfaction and loyalty (Wattoo & Iqbal, 2022). However, gaining customer loyalty in online shopping can be challenging.

According to Srinivasan et al. (2002), it is difficult for a company to augment customer loyalty in an online environment because consumers can access another brand with a single mouse click (Yushar et al., 2023). Customers are more interested in buying products or services from well-established and popular brands (Malik et al., 2012). Kim et al. (2012) state that the key factor determining the success of a business is maintaining customers' trust. Value is also an important component of customer satisfaction and loyalty (Afaq et al., 2023). The brand needs to provide a quality product to the customer so that it satisfies them, which as a result makes them loyal to the brand. If a brand wants to work on online sales, it needs to operate an e-commerce website, as a high-quality website enables a company to attract people and most importantly retain them as loyal customers (Venkatakrishnan et al., 2023).

Li et al. (2001) find that the quality of the website can influence e-commerce success, as it informs users through messages about the financial performance of the business (Venkatakrishnan et al., 2023). Prior studies have discovered a direct relationship between customer satisfaction and customer loyalty (see Bowen & Chen, 2001; Venkatakrishnan et al., 2023). Moreover, the literature suggests that customer satisfaction's effect on customer loyalty is likely to play a key role in the connection between brand image, price, trust and website quality (Tannady & Purnamaningsih, 2023; Wilis & Nurwulandari, 2020). The literature documents the influence of various variables on customer loyalty in online shopping, such as brand image, price, trust, customer satisfaction and website quality. Despite this attention, the specific path through which these variables create customer loyalty remains unclear.

This study investigates the sequential and parallel mediation between brand image and customer loyalty, aiming to assess the effects of brand image, price, trust and website quality on customer loyalty through the mediation of customer satisfaction. The study also addresses the practical implications for emerging e-commerce businesses. Notably, although studies have been carried out on customer satisfaction and loyalty in online shopping (Tang et al., 2005; Tannady & Purnamaningsih, 2023), little research has been conducted on online shopping in Pakistan (Wattoo & Iqbal, 2022). Akram et al. (2022) also state that there is a lack of research on online shopping customers in Pakistan and this needs to be studied further.

One of the contributions of this study is that it provides knowledge related to online shopping and how this affects customers' satisfaction and

loyalty, along with brand image, price, trust and website quality. Additionally, this study contributes to the marketing literature by providing a deeper understanding of the parallel and sequential mediation path between brand image and customer loyalty. Furthermore, the results are helpful for online customers, showing them how they can increase their value by keeping in mind certain standards for effectiveness.

This study is structured as follows. The next section comprises the literature review. Section 3 contains the research methodology. Section 4 focuses on the data analysis. Section 5 discusses the results, implications and conclusion, followed by proposed research directions and limitations.

2. Literature Review

2.1. Theoretical Framework

According to the technology acceptance model (TAM), the goal of acknowledging or utilizing another innovation is dictated by its apparent handiness and usability. Therefore, customers choose between purchasing a product they like or want (Hafiza et al., 2022). Expectation-confirmation theory (ECT) explains purchaser satisfaction and repurchase conduct or loyalty (Valvi & West, 2013), arguing that a customer's expectations will help them decide which product to buy.

Next, purchasers will settle on their degree of satisfaction depending on the degree to which their desire is met by the product or service (Oh, 2022). Heeler et al. (1979) state that expectancy-value theory is about clients frequently making judgments about a product, its advantages and the possible results of utilizing the item. Individuals will determine which conduct is most likely to yield positive results, depending on their convictions about the product's traits and the quality of these opinions. People act based on their beliefs about a product's qualities and the perceived quality of those opinions. It is widely recognized that these product characteristics influence consumer behavior.

2.2. Brand Image and Customer Loyalty

A brand is defined as the name, logo and representation of a company or any additional feature that distinguishes one company's product from that of another (Cochoy, 2014). From a customer's point of view, the brand is an underwriter of firm quality and value. Thus, customers will want to purchase and use items or products from selected

brands to identify their practices in different circumstances. Furthermore, customers will want to purchase from brands that retail products that meet their demand. Brand image in turn is a significant arrangement of relationships in consumers' awareness of what a brand depends on and the contingent assurances that make the brand (Purwanto, 2022).

Brand image can be created through publicizing efforts and is approved through instantaneous encounters with consumers. Customers carry different reflections about a company. A company's brand image is a significant intangible asset that is difficult to mirror and can help achieve maintainable and unrivaled budgetary execution. Brand image is crafted through marketing efforts and confirmed through real-time interactions with consumers. In addition, it emphasizes the role of brand image as a valuable, hard-to-replicate asset that can contribute to sustained financial success (Roberts & Dowling, 2002). A trustworthy brand image allows customers to separate their desires that the brand satisfies; it separates the company from others and improves the shopper's execution of that brand.

Malik et al. (2012) demonstrate a significant and progressive association between brand image and customer loyalty. Brand image is important in business sectors where it is difficult to separate items that depend on quality highlights (Mudambi et al., 1997). Eventually, the buyer incorporates all brand data and structures a general idea reflecting the brand character and connections. The customer's interaction with the brand then builds up a perspective of that brand, which leads to loyalty. Based on these arguments, the following hypothesis is proposed:

Hypothesis 1: Brand image has a positive effect on customer loyalty.

2.3. Influence of Price

Price is the amount of cash that shoppers must bargain with to obtain a product or service. Many shoppers use price as an indication of 'you get what you pay for' (Erickson et al., 1985). By the same token, price is what is yielded or relinquished to acquire a product or service. Customers scrutinize the price offered by the seller, compare it with the prices offered by other sellers and subsequently assess the product when shopping online (Kim et al., 2012). Different prices for a similar product or service can be obtained from various sites, enabling the shopper to make the best financial choice. Moreover, in a market with many brands making and selling the same product, lower charges provide some leeway for competition (Bojanic, 1996).

Suhud (2022) demonstrates that the additional value a shopper pays, rather than abandon the purchase of a product, over what they actually pay reflects the financial value of their satisfaction. When a customer is satisfied after obtaining a product, they are more likely to become loyal to that brand (Srinivasan et al., 2002). Previous studies have shown that brand image affects other variables, including price, quality, loyalty and satisfaction (Suhud, 2022). Shoppers' decisions regarding online shopping networks are influenced by the prices offered by a specific site or online brand (Maarif et al., 2019; Sari et al., 2023).

Hypothesis 2: Brand image has a positive effect on customer satisfaction mediated by price.

Hypothesis 3: There is a significant combined indirect effect of brand image, price and customer satisfaction on customer loyalty.

2.4. Influence of Trust

In any market, the buyer-seller relationship is important to observe. Researchers have also taken an interest in the role of trust in social trade relations (Chen, 2010). A constructive conviction about the quality and constancy of an article reflects trust (Lopes & Galletta, 2006). Trust plays a critical role in the use and upkeep of a product (Dagger & O'Brien, 2010). There is also a positive connection between online trust and loyalty (Juwaini, 2022). Subsequently, we expect trust in a web-based shopping site to play a significant role in consumers' repurchase intentions.

Trust reflects a conviction at the shopping stage that a consumer can depend on the producer to provide a guaranteed item as well as a smooth web-based shopping experience. Consequently, trust plays a key role in the relationship between the consumer and brand image (Wilis & Nurwulandari, 2020). In addition, brand image is influenced by trust when customers trust the quality of the product they purchase. Trust facilitates the decision-making process, which results in customer satisfaction (Khan & Fatima, 2023).

Hypothesis 4: Brand image has a positive effect on customer satisfaction mediated by trust.

Hypothesis 5: Brand image has a positive effect on customer loyalty mediated by trust.

Hypothesis 6 There is a significant combined indirect effect of brand image, trust, and customer satisfaction on customer loyalty.

2.5. *Influence of Website Quality*

There are various dimensions of site quality assessment in the literature (Wolfinbarger & Gilly, 2003). Site quality includes information, security, comfort, pleasure and organization. Customers' impressions of site quality drive their buying aims (Bai et al., 2008). Ease of use, accurate data and exchange security also determine customer acknowledgment (Palmer, 2002). Customers' purchase intentions are influenced by the quality of a website, including factors such as information, security, comfort, pleasure, and organization, with ease of use, accurate data, and exchange security being crucial factors.

Bennett and Rundle-Thiele (2004) argue that quality is an indication of satisfaction and consumer loyalty. The literature demonstrates that consumer loyalty prompts client devotion (Anderson et al., 1994). This positive relationship is also found in an online shopping study by Martín-Consuegra et al. (2007), which audits the brand loyalty literature. When a customer purchases a product from a brand and is satisfied, they will become more loyal to that brand (Sun, 2022).

The website quality of a brand is vital to the hypothesis that solid brands increase the value of customers buying a product or service (Low & Lamb, 2000). During the COVID-19 pandemic, for example, when customers had to shop from home, brands needed websites that did not crash or yield errors so that customers could easily buy whatever they wanted (Akram et al., 2022; Venkatakrishnan et al., 2023). Customer buying behavior in online shopping depends on website quality, allowing the brand to retain customers' loyalty (Rahman & Hossain, 2023).

Hypothesis 7: Brand image has a positive effect on customer loyalty mediated by website quality.

2.6. *Customer Satisfaction and Customer Loyalty*

A buyer's affirmative or opposing outlook on related knowledge is characterized as satisfaction (Oliver, 1980). Customer satisfaction involves assessing how well a customer's current feelings, particularly those surrounding unmet expectations, align with their prior experiences and expectations related to a product or service

A higher level of shopper satisfaction is more likely to benefit a brand than a lower level of shopper satisfaction (Koay, 2022). A brand image refers to the association between a brand and its perception (Bong Na et al., 1999). Customers tend to remember a particular experience or quality of a product and how they obtained a certain level of satisfaction from it (Setyorini et al., 2023).

Shoppers can modify their buying choices more effectively in online situations than in physical conditions. In the online domain, even though customers boost their cooperation with the seller through the site, it is difficult for the seller to retain customer loyalty when purchasers can leave simply by clicking the mouse (Srinivasan et al., 2002).

Oliver (1980) studies the relationship between consumer loyalty, trust and reliability. Customer loyalty and trust in web-based business sites can influence buyer maintenance or client dependability. Bennet and Rundle-Thiele (2004) find that a unique brand or product image positively affects loyalty. Thus, price, trust, website quality, customer satisfaction and customer loyalty have positive relationships with brand image, while customer satisfaction has a mediating effect on customer loyalty (Wilis & Nurwulandari, 2020; Setyorini et al., 2023). Therefore, we hypothesize that:

Hypothesis 8: Brand image has a positive effect on customer satisfaction.

Hypothesis 9: Brand image has a positive effect on customer loyalty mediated through customer satisfaction.

Hypothesis 10: Customer satisfaction has a positive effect on customer loyalty.

3. Methodology

3.1. Research Model

The study's proposed model is shown in Figure 1. The parallel and sequential mediation model comprises the direct and indirect relationships between brand image, price, trust, website quality, customer satisfaction and customer loyalty.

Figure 1: Study Model
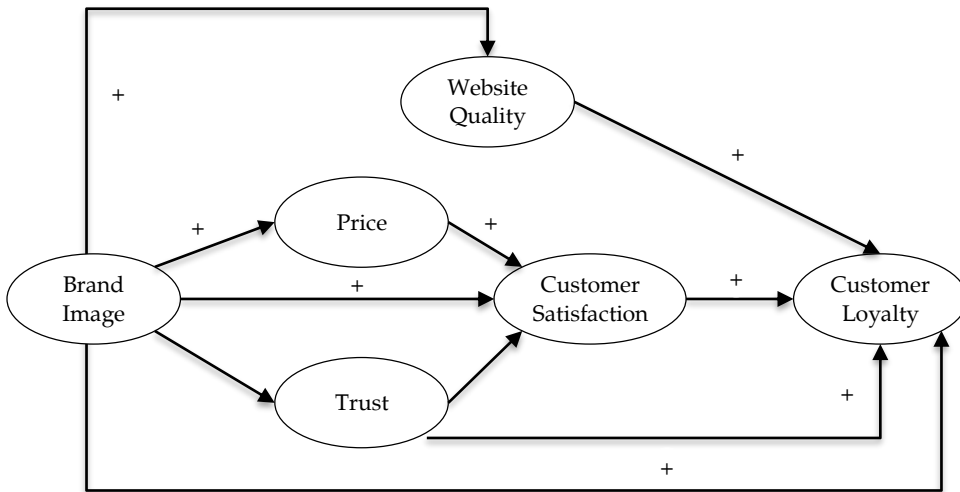
3.2. Data Collection

This is a deductive, quantitative and cross-sectional study, with data collected at a single point in time. We have used convenience sampling to collect the data. The population for this study included the citizens of Lahore. An online questionnaire survey was developed and sent to 120 respondents. Eighty-nine people completed the questionnaire, of which ten questionnaires were fragmented (some respondents had not answered all the questions and some had answered the screening question incorrectly). Finally, 78 questionnaires were usable, which yielded a response rate of 65 percent. According to Gliem and Gliem (2003), this response rate is satisfactory. The customers surveyed included those who shop frequently (visiting the shop at least twice in the last six months). The respondents needed to be 20 years old or above to ensure credibility and must possess credit cards to be able to shop online.

A comprehensive introduction to the survey and URL address was emailed to the customers. Two questions were designed to attract and engage authentic respondents. The first question was: 'Have you shopped online?' This question ensured that they had online purchasing experience. All the respondents answered 'yes' to this question. If they had said 'yes', then the second screening question popped up on their screen, which asked, 'Which e-shop is your favorite one?' The second question was to ensure that the customer had had a satisfying shopping experience at their favorite

online store. After reviewing the data for online retailers, four were reported to have been visited the most: Daraz, Metro, Carrefour and Ali Express.

3.3. Data Analysis

SPSS was used to conduct the data analysis. Several preliminary analyses were conducted, including reliability analysis, correlation analysis, and one-sample t tests. Subsequently, regression analysis was used to investigate the relationships proposed and determine potential outcomes. We analyzed the data using linear regression analysis, which provides a relationship between an independent variable and a dependent variable. Linear regression has become an established and reliable way to predict results (Saliya, 2022; Vardopoulos, 2023). Finally, Smart-PLS was used to determine the parallel and sequential mediation effects.

4. Results

4.1. Reliability Analysis

Table 1 shows the results of the reliability analysis of all the variables. Brand image consists of four items with a Cronbach's alpha value of 0.787. Price consists of four items and has a Cronbach's alpha value of 0.723. Trust consists of four items and has a Cronbach's alpha value of 0.814. Website quality consists of four items and has a Cronbach's alpha value of 0.773. Customer satisfaction consists of four items, with a Cronbach's alpha value of 0.872. Last, customer loyalty consists of four items and has a Cronbach's alpha value of 0.715. As the results depict, all the variables have a Cronbach's alpha value greater than the threshold level of 0.7 (Gliem & Gliem, 2003).

Table 1: Reliability Analysis

Construct Name	Cronbach's Alpha	Number of Items
Brand Image	0.787	4
Price	0.723	4
Trust	0.814	4
Website Quality	0.773	4
Customer Satisfaction	0.872	4
Customer Loyalty	0.715	4

4.2. Correlation Analysis

Table 2 displays the values for the correlation between the study variables. The correlation matrix shows that there are positive and significant relationships between all the variables. Specifically, there are positive and significant relationships between customer loyalty, brand image, price, trust, website quality and customer satisfaction.

Table 2: Correlation Analysis

Variable Name	SD	M	1	2	3	4	5	6
Customer Loyalty	0.655	3.66	1					
Brand Image	0.777	3.74	0.477**	1				
Price	0.702	3.75	0.413**	0.929**	1			
Trust	0.784	3.82	0.465**	0.989**	0.936**	1		
Website Quality	0.648	3.70	0.419**	0.535**	0.539**	0.540**	1	
Customer Satisfaction	0.841	3.66	0.447**	0.810**	0.672**	0.818**	0.519**	1

Note: M = mean, SD = standard deviation, $* p < 0.05$, $** p < 0.01$, $*** p < 0.001$.

4.3. One-Sample t Test

The one-sample t test calculates the association between the mean of a single sample and a prearranged value, which helps us conclude whether the sample means are significantly greater or less than that value (Saliya, 2022). Our results show that all the variables are significant. The sample mean is also significant. For instance, brand image (t = 8.554, p = 0.001) is accepted according to the one-sample t test. Similarly, price (t = 9.349, p = 0.001), trust (t = 8.517, p = 0.001), website quality (t = 11.21, p = 0.001), customer satisfaction (t = 7.432, p = 0.001), and customer loyalty (t = 8.982, p = 0.001) are accepted according to the one-sample t test.

Table 3: One-sample t Test Results

Variable Name	t value	p value	Decision
Brand Image	8.554	0.001	Accepted
Price	9.349	0.001	Accepted
Trust	8.517	0.001	Accepted
Website Quality	11.21	0.001	Accepted
Customer Satisfaction	7.432	0.001	Accepted
Customer Loyalty	8.982	0.001	Accepted

4.4. Regression Analysis

Table 4 gives the results of three hypotheses. As the direct results indicate, hypothesis 1 is supported, indicating that brand image has a positive relationship with customer loyalty (t = 4.727, p = 0.001). Hypothesis 8, which posits that brand image has a positive relationship with customer satisfaction (t = 12.04, p = 0.001), is also supported. The results support hypothesis 10, which shows that customer satisfaction has a positive relationship with customer loyalty (t = 4.353, p = 0.001). As shown in Table 4, the regression results support all three hypotheses. Demographic variables such as gender and age are used as control variables. The results demonstrate (R^2 = 0.863, p = 0.001) that the model is fit and that the dependent variable is explained by all the independent variables with a variation of 86 percent.

Table 4: Regression Analysis (direct path)

No	Hypothesis	Beta	SE	t value	p value	Decision
	Direct path					
1	BI →CL	0.402	0.085	4.727	0.001	Supported
8	BI →CS	0.877	0.073	12.04	0.001	Supported
10	CS →CL	0.348	0.080	4.353	0.001	Supported

Note: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001. The table shows the beta coefficients along with the significance level of their t-statistics as well as the p value. The number of cases was 78. Brand image = BI, customer satisfaction = CS, customer loyalty = CL.

4.5. Parallel and Sequential Mediation

Table 5 gives the parallel and sequential mediation results computed through bootstrapping analysis in Smart PLS.

Table 5: Parallel and Sequential Mediation (indirect path)

No	Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV)	P values
2	Brand image -> price -> customer satisfaction	-1.295	-1.319	0.326	3.977	0.000
3	Brand image -> price -> customer satisfaction -> loyalty	-1.262	-1.282	0.280	3.936	0.000
4	Brand image -> trust -> customer satisfaction	2.185	2.274	0.382	5.714	0.000
5	Brand image -> trust -> loyalty	2.518	-1.645	0.943	2.550	0.001

No	Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV)	P values
6	Brand image -> trust -> customer satisfaction -> loyalty	-1.442	2.488	0.468	4.943	0.002
7	Brand image -> website quality -> loyalty	0.095	0.128	0.141	0.671	0.504
9	Brand image -> customer satisfaction -> loyalty	-1.022	-1.043	0.284	4.265	0.001

Parallel mediation refers to a statistical model in which multiple mediators operate independently, concurrently influencing an outcome variable without a sequential relationship, allowing for a simultaneous examination of their individual contributions (Dhiman & Arora, 2023). In the specific indirect path, we check the mediation for several hypotheses, including hypothesis 2, hypothesis 3, hypothesis 4, hypothesis 5, hypothesis 6, hypothesis 7, and hypothesis 9, through the process of bootstrapping in Smart PLS. Specifically, we check the significance by analyzing the bootstrap results.

Subsequently, we examine the significance values, which show that apart from one, all the hypotheses are supported. Specifically, hypothesis 2 (p = 0.000), hypothesis 3 (p = 0.000), hypothesis 4 (p = 0.000), hypothesis 5 (p = 0.001), hypothesis 6 (p = 0.002), and hypothesis 9 are supported (p = 0.001). Only hypothesis 7, which posits that brand image has a positive effect on customer loyalty mediated by website quality (p = 0.504), is not supported.

5.   Discussion and Conclusion

5.1. *Discussion of Research Findings*

This research adds value to the literature by utilizing a parallel and sequential mediation model to assess the effects of brand image, price, trust, and website quality on customer loyalty through the mediation of customer satisfaction. In contrast to website quality, brand image positively impacts price, trust, customer satisfaction and customer loyalty. All but one hypothesis is supported.

Sequential and parallel mediation support the relationship between brand image, price, trust, customer satisfaction and loyalty. In determining trust, brand image is an important factor: a strong, attractive brand enhances customers' trust associated with that product or service. This

result complements the work of Chen (2010). A strong brand image allows consumers to ascertain the requirements that the brand fulfills to differentiate it from its competitors and increase their willingness to purchase (Lin, 2007). A favorable image of a product or service among customers helps to increase the brand's market share (Sheng & Liu, 2010).

The results show that price positively influences customer satisfaction. For instance, when customers have faith in prices that are fair and reasonable, they are more likely to construct a positive opinion of that product and brand (Wilis & Nurwulandari, 2020).

Our results show that trust plays a pivotal role in forming customer loyalty and retaining it in the long run, in line with Wilis and Nurwulandari (2020) and Venkatakrishnan et al. (2023). Trust builds a firm relationship between a brand and its customers (Morgan et al., 1994) and is considered among the determinants of loyalty. It is very difficult to satisfy customers and build relationships in the long run without gaining their trust. This is demonstrated by the results, which show that the mediation of trust and customer satisfaction in the relationship with brand image has a positive impact on customer loyalty. These findings complement previous research such as Chaudary et al. (2014).

The research shows that website quality has a positive influence on customer loyalty. When a brand provides brief information on the product and the website is easy to access and use, the customer will visit it repeatedly and show more interest in purchasing from that brand. This helps us understand the influence of website quality on customer satisfaction, given that other online competitors are just one mouse click away. Website quality enables a company to attract people and, most importantly, retain them as loyal customers. Li et al. (2001) find that the quality of a website can influence e-commerce success, as it informs users through messages about the financial performance of the business. Nevertheless, website quality as a mediator is not supported by our study.

Our findings show that customer satisfaction has a positive impact on customer loyalty (Bowen & Chen, 2001; Venkatakrishnan et al., 2023). Previous studies show that a higher level of customer satisfaction leads to greater customer loyalty (Kura, 2011). Our study provides further support for this argument through statistical evidence. Customer satisfaction is a leading predictor of customer loyalty (Rosell et al., 1994; Tannady & Purnamaningsih, 2023). The findings show that brand image, price and

trust have positive impacts on customer satisfaction and loyalty, examined through the direct and indirect relationships among the constructs.

5.2. Theoretical Implications

Our findings contribute to the marketing literature in regard to the online business environment by revealing how businesses can obtain larger market shares by considering the value addition necessary for creating customer satisfaction and loyalty. Using the TAM and expectation-confirmation theory and employing a parallel and sequential mediation model, this study contributes to the literature on customer loyalty.

5.3. Practical Implications

This study shows that if e-retailers offer reasonable prices, build trust and shape a strong brand image, they can satisfy customers and retain them in the long run. Our findings can help managers of e-retailers obtain a competitive advantage by enhancing customer satisfaction and loyalty.

5.4. Limitations and Future Recommendations

First, due to the shortage of time and the COVID-19 crisis, the sample was not large, which limited the scope of the study. Second, this study focused on online shopping in Pakistan. Therefore, the results of this study might not be generalizable to other countries. Future researchers could test this model in the context of other countries. Third, this study focuses on website quality and price as a whole. Future researchers could explore various aspects of website quality such as functionality and usability, and assess different pricing strategies. Fourth, online reviews play an important role in the development of a strong brand image. Thus, future researchers could incorporate this construct into the model.

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