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You Reap What You Sow – Abusive Leadership impact on Organizational Digital Innovation through knowledge workers' competence and productivity

Abstract

Purpose—This research aims to determine how abusive leadership negatively affects knowledge workers' productivity and its potential influence on digital innovation. The present study also explores the mediating role of a knowledge worker's competence between abusive leadership and knowledge worker productivity.

Design/methodology/approach – The study employed a quantitative research approach, and data was gathered through purposive sampling using 255 questionnaires completed by IT industry knowledge workers in Pakistan. The data was analyzed utilizing the SMART-PLS 4.0 software.

Findings – The findings demonstrated a negative correlation between abusive leadership and knowledge worker productivity. Additionally, the relationship was partially mediated by knowledge worker competence. Furthermore, the study asserts that knowledge worker productivity has a substantial positive impact on digital innovation.

Originality – This study contributes substantially to the existing body of evidence on the productivity of knowledge workers and digital innovation by examining the interlocking effects of abusive leadership. It also implies the interpersonal mechanism of employee competence that connects abusive leadership with the productivity of knowledge workers and digital innovation. Thus, this study is one of the first inquiries to analyze this paradigm.

Keywords: Knowledge Workers, Knowledge Worker Productivity, Abusive Leadership, Digital Innovation,

1. Introduction

The knowledge-based view places a high value on knowledge resources and knowledge management processes. The subjectivity of knowledge management, such as the motivation and satisfaction of knowledge workers, is crucial rather than focusing solely on an objective perspective (Shujahat et al., 2019; Chatzoudes et al., 2015). Research has been conducted on the subjectivity of knowledge management, such as the satisfaction levels of knowledge workers, in many contexts (Zhao et al., 2021; Shahzadi et al., 2021; Viñas-Bardolet et al., 2020). Due to the growing importance of human factors attached to knowledge management dynamics, the human aspect of the said domain should be considered. The IT sector in Pakistan is an essential driver of economic growth and employment. Knowledge workers are critical for organizations in this sector, as they possess specialized skills and knowledge. However, knowledge worker productivity and digital innovation are challenging for these organizations.

In the last two decades, digital innovation has evolved with the shift of highly sophisticated technological advancements in organizations (Di Vaio et al., 2021; Jiao et al., 2022). The leader's role, in this direction, is essential to shape an individual's mindset toward digitalization and adoption of digital technologies (Nwankpa & Roumani, 2024; Scuotto et al., 2023). Furthermore, leaders' maintaining an agile orientation in organizations may lead to positive behaviors and outcomes (Del Giudice, 2021; Berraies et al., 2021). Professional leaders promote digital transformation by impacting their employee's level of self-efficacy in terms of positive change in their attitude toward technology adoption and enhancing the level of digital literacy among them (Malodia et al., 2023; Muhammed and Zaim, 2020). Contrarily, abusive supervision, defined as supervisors' behaviors that undermine their subordinates' dignity and respect, can negatively impact knowledge worker productivity, and hinder digital innovation. Moreover, employee's emotional state and psychological well-being also connect negatively to their role in technology and innovation (Scuotto et al., 2023) in the presence of abusive leadership. Prior research has demonstrated a notable moderated mediating impact of abusive supervision on the overall influence of procedural justice on the creativity of office workers in the context of South Korean companies, and on employee creativity in Chinese SMEs (Akram et al., 2022; Choi et al., 2022). Nevertheless, scholars have neglected the examination of the structural influence of the direct relationship of abusive supervision on knowledge worker productivity and digital innovation in

the IT sector. Therefore, it is imperative to investigate the effect of abusive leadership on knowledge worker productivity and digital innovation (Oubrich et al., 2021; Pellegrini et al., 2020; Jiao, 2022). According to the conservation of resources (COR) perspective, innovative work practices or creativity are needed extensively on the job (Choi et al., 2022). Certain job responsibilities require knowledge workers to have strong mental and physical health, eventually boosting their motivation by effectively utilizing available resources (Hossan et al., 2022). On the other hand, if the job demands are high and the resources are less utilized, it gives rise to a high level of stress, less innovation, and low productivity (Choi et al., 2022) particularly in the IT sector.

Moreover, in the context of knowledge workers in the IT sector, who rely heavily on their cognitive abilities and expertise to perform their job tasks, abusive supervision can have a detrimental impact on their competence. Abusive supervision can hinder knowledge sharing and collaboration among IT workers, leading to a decline in collective competence (Carmeli et al., 2011). Previous studies have found that abusive supervision was negatively related to employee competence, knowledge-sharing behavior of employees, and knowledge-worker competence in various industries (Aryee et al., 2007; Carmeli et al., 2011; Wang et al., 2022). Nevertheless, there has been no research endeavor to explore how the competency of knowledge workers elucidates the mechanism via which abusive supervision affects the productivity of knowledge workers in the context of digital innovation. Knowledge worker competence acts as a mediator in the relationship between abusive supervision and knowledge worker productivity, providing insight into the how of this relationship. Razzaq et al. (2018) and Chatzoudes et al. (2015) also advocated studying this mediator in the context of knowledge management dynamics, arguing that the subjective perspective of knowledge management, such as knowledge workers' motivation and satisfaction, should be taken into account. Thus, it is critical to investigate the mediating function of knowledge worker competency in the relationship between abusive supervision and knowledge worker production in the IT sector. Furthermore, the current corpus of literature has not sufficiently examined the interconnectedness between the productivity of knowledge workers and digital innovation (Tariq et al., 2024).

The study makes a novel theoretical contribution by filling the gaps present in the literature and investigating a distinctive model that explores the relationship between abusive leadership and knowledge worker productivity, the subsequent relationship between knowledge worker productivity and digital innovation, and the potential for knowledge worker competence to boost

knowledge worker productivity despite abusive leadership within the IT sector of Pakistan. Besides the human aspect of knowledge management dynamics relatively under-researched (Oubrich et al., 2021; Pellegrini et al., 2020), previous studies have only investigated the impact of abusive supervision on employee outcomes, such as job satisfaction and turnover intentions. However, this study contributes theoretically to how abusive leadership may impact organization outcomes such as digital innovation (Kim et al., 2020). Furthermore, the role of knowledge worker competency as a mediator in this connection has not yet been evaluated in the IT sector of Pakistan. By examining the mediating role of knowledge worker competence in the relationship between abusive supervision and knowledge worker productivity, this study will enhance our understanding of the mechanisms through which abusive supervision affects digital innovation in the IT sector of Pakistan. Knowledge workers are constantly engaged in learning activities to enhance their competencies, ultimately facilitating innovation at the workplace in the ever-changing work environment (Zheng, 2024; Sumbal et al., 2023a; Oberländer et al., 2020). Razzaq et al. (2019) explained that the competencies needed for knowledge workers are interrelated to innovation in knowledge-intensive organizations. Finally, this study holds theoretical significance by providing valuable insights into how knowledge workers can thrive in organizations prioritizing knowledge.

2. Hypothesis Development and Conceptual Framework

2.1 Abusive Supervision and Knowledge Worker Productivity

Abusive supervision has been explained by Tepper (2000) as the perception of the subordinates to the extent that shows the engagement of the supervisors in a display of hostile behavior whether verbal or non-verbal, but which excludes physical contact. The term was operationalized through inquiring the employees about different kinds of hostile actions their supervisors perform (e.g., “tells me my thoughts or feelings are stupid,” “puts me down in front of others,” “blames me to save himself/herself embarrassment”). Peter Drucker, for the first time, devised the term "Knowledge worker productivity," which depends upon several factors that ultimately affect the task at hand, for instance, "output's quality and quantity, task's nature, the allocated time for the task to perform, etc.". It can also be termed how the knowledge worker is proficient in utilizing the knowledge available to attain productive results (Drucker, 1999). The employees' morale is impacted if the supervisor is abusive, which negatively affects the overall performance and

productivity of the employees when performing innovative tasks (Offergelt & Venz, 2023). This behavior is ultimately trickled down to the subordinates of the employees, resulting in a weakened knowledge management process and their productivity through knowledge withholding, which impacts the overall operations (Kmieciak, 2024; Offergelt & Venz, 2023). Previous research has shown that abusive supervision can lead to decreased job satisfaction, increased turnover intentions, and decreased job performance in knowledge workers (Liu et al., 2013). Specifically, Liu et al. (2016) found that abusive supervision harmed employee creativity in Chinese IT firms. Similarly, Zhang and Liao (2015) found that abusive supervision had a negative impact on employee job performance, with the effect being more substantial for workers in highly interdependent tasks. In the same vein, a study conducted in baking sector showed that abusive supervision reduces the knowledge worker productivity by impacting their knowledge sharing, creation, and application capability (Ahmed et al., 2021). Moreover, abusive supervision negatively impacts employee creativity and job performance in organizations where there is sole reliance on knowledge workers for creativity and innovative tasks (Kim et al., 2020). Thus, we hypothesize that:

H1: Abusive supervision negatively impacts knowledge worker productivity.

2.2 Abusive Supervision and Knowledge Worker Competence

Knowledge worker competency has its roots in the term competent, which was first used in the book, "The Competent Manager" by Boyatzis (1982, p.21) which means an underlying characteristic of a person that could be a motive, trait, and skill aspect of one's self-image or social role, or a body of knowledge which he or she uses whereas competency is described as the set of traits in the personality, the attributes and the skills in the knowledge worker, necessary to do the job effectively (Boyatzis, 2008). When knowledge workers are competent, they work for the best quality output and help in innovation in the organization towards better business strategy (Zheng, 2024), along with less turnover among the workforce (Potnuru et al., 2021). Knowledge worker competence helps solve complex problems, create new knowledge, and do innovative tasks at the workplace which is need of the hour in the current digital platforms based organizations (Bhatti et al., 2024; Zhao et al., 2021). Studies have found that abusive supervision can reduce psychological wellbeing among knowledge workers (Tepper, 2000; Aryee et al., 2007). Furthermore, abusive

supervision can undermine employees' confidence and create self-doubt, reducing cognitive functioning and decision-making abilities (Aryee et al., 2007), reducing knowledge sharing and collaboration leading to a decline in collective competence (Carmeli et al., 2011). Hence, abusive supervision leads knowledge works to low organizational commitment by impacting their competencies (Wang et al., 2022). Thus, we hypothesize that:

H2: Abusive supervision negatively impacts knowledge worker competence.

2.3 Knowledge worker competence and knowledge worker productivity

Work-related skills, knowledge of the tasks, and personal attributes of the knowledge workers needed to attain sustained increased productivity in the organization can be named "competencies" (Alam, 2022). Knowledge workers and individual productivity differ based on the time allocated for the task to be performed efficiently. The knowledge worker starts doing a task even though it is full of complexities; the resources available remain within the given time through the utilization of core competencies (Sumbal et al; 2023b; Ahmed et al., 2021). Previous research has supported the relationship between knowledge worker competence and productivity. For instance, a study by Sahibzada and Mumtaz (2023) found that knowledge worker competence was positively associated with job performance. Similarly, studies found that when knowledge workers utilize their core competencies such as innovativeness, it results in higher productivity (Ng et al., 2020; Pang et al., 2019) leading us to the hypothesis that:

H3: Knowledge worker competence positively leads to knowledge worker productivity.

2.4 Knowledge Worker Productivity and Digital Innovation

In knowledge-intensive organizations, workers perform efficiently by learning innovative practices and implementing procedures, which are usually applied where the assignments and jobs are disorganized and unstructured (Kianto et al., 2019). Innovative tasks require specialized knowledge and skills, which are the core characteristics of knowledge workers who use these skills using the emerging state of the art technologies (Massa et al., 2024; Bhatti et al., 2024; Nwankpa & Roumani, 2024). Hence, knowledge workers play a pivotal role in innovating new products to sustain competitive advantage for digital firms such as Google and Microsoft. Productive knowledge workers are more likely to generate innovative ideas and contribute to digital

innovation in their organizations through various digital capabilities and knowledge-oriented leadership (Tariq et al., 2024; Fatima & Masood, 2024; Khatri et al., 2023; Scuotto et al., 2023; Ahmed et al., 2021). In the context of the IT sector, where digital innovation is critical for organizational success, productive knowledge workers are likely to play a crucial role in promoting innovation and generating new digital solutions as IT sector is based on intensive usage of digital platforms (Bhatti et al., 2024; Velyako & Musa, 2023). Previous research has provided support for the relationship between productivity and innovation. For example, a study by Hsu et al. (2023) found that higher levels of individual productivity among knowledge workers are positively related to innovative work behavior. Knowledge workers are crucial in driving digital innovation and elevating productivity while paving the way for new digital products and services (Tønnessen et al., 2021; Shujahat et al., 2019). Greater productivity will be achieved in the generation of ideas by creating and sharing new knowledge and improving the quality of work (Chen et al., 2020). In the context of the IT sector, where knowledge workers are highly skilled and knowledge-intensive, productive knowledge workers are likely to play a critical role in promoting digital innovation. This leads to the following hypothesis:

H4: Knowledge worker productivity positively leads to digital innovation.

2.5 Mediating Role of knowledge worker competence

Previous research has provided support for the mediating role of knowledge worker competence in the relationship between abusive supervision and job outcomes. For example, a study by Aryee et al. (2007) found that the negative relationship between abusive supervision and job performance was partially mediated by employee creativity and organizational citizenship behavior. Similarly, a study by Leonelli (2022) showed that employee psychological empowerment mediated the negative relationship between abusive supervision and job satisfaction. Similarly, Shujahat et al. (2019) found that skills, abilities, and competencies positively influence the overall productivity of knowledge workers, which is vital for driving innovation in knowledge-intensive organizations (Fatima and Masood, 2024). In the context of the IT sector, where knowledge workers are critical for organizational success, abusive supervision can negatively affect these competencies and skills leading to decreased knowledge productivity. So, the study hypothesizes.

H5: Knowledge worker competence negatively mediates the relationship between abusive supervision and knowledge worker productivity.

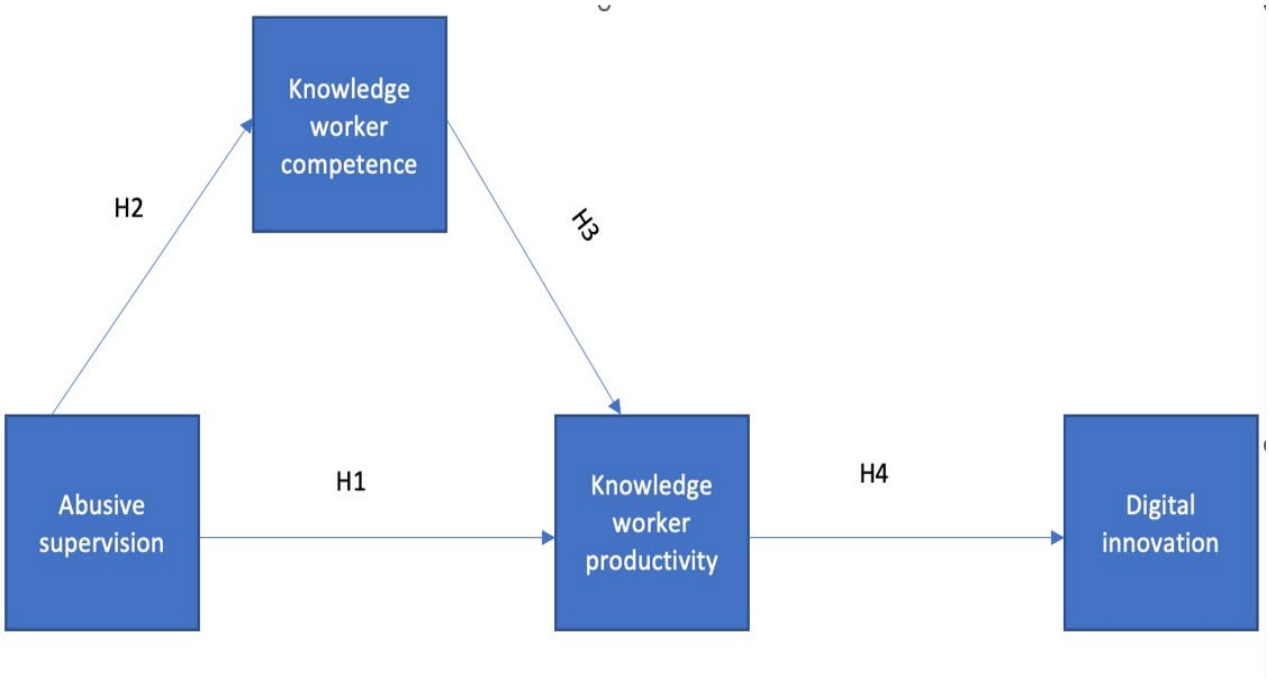

Figure 1: Conceptual framework of the study (source: authors)

2. Methodology

In this section, a detailed overview of the methodology of the study is discussed in order to address the research objective and research questions. The survey-based method was used to assess the impact of abusive leadership on organizational digital innovation through knowledge workers' competence and productivity. After a survey of the literature, a conceptual framework of the study (Fig. 1) was developed, describing the main ideas investigated in this study and the theories that go along with them.

3.1 Research Context

In order to test the proposed hypothesis, we distributed questionnaires among the knowledge workers in the IT sector of Pakistan, mainly software houses, which are involved in creating, sharing, and utilizing knowledge (Shujahat et al., 2018). The target group was chosen because of the highest level of innovation in the sector, involvement of the clients, and knowledge-based activities. Secondly, the knowledge management infrastructure is better and firmer in the IT

sector than in other sectors of Pakistan. In other words, the IT sector is a progressive sector with an intensive organizational learning culture that enhances the knowledge processes. Furthermore, IT sector provides knowledge workers with sophisticated technologies to enhance collaboration, communication, and access to information. Digital platforms optimize the process of exchanging information and enable remote work, hence improving efficiency and adaptability. Data analytics technologies empower knowledge workers to extract meaningful insights from extensive databases, hence enabling decision-making processes in the organization (Kamdjoug et al.,2023; Sumbal et al., 2021). Finaly, knowledge workers in the IT sector are focused on digital innovation and are critical to the organization (Tariq et al., 2024).

3.2 Data Collection and Sampling

In order to address the research questions, the data was collected from knowledge workers in the IT sector through purposive sampling. The study is quantitative, and the time horizon for data collection is cross-sectional (Neuman, 2013). The sample size is 255. Data analysis was performed through Smart PLS 4.0 using "PLS-SEM (Partial Least Square Structure Equation Modelling). The methodology adopted for the empirical investigation was the application of Partial Least Squares Structural Equation Modelling (PLS-SEM). This approach enables scholars to analyses the connections among variables by predicting the dependent ones (Del-Castillo-Feito et al., 2022). The choice to implement PLS-SEM is backed by authors such as Chin, et al.(2003); Hair et al.(2014), who view it as an approach with significant benefits for research involving complicated problems that lack extensive theoretical justifications (Hair et al., 2017). This analyzing technique is accurate for the study due to its minimum requirement regarding fulfillment of the normality assumptions of the data and its greater predictive accuracy. Most importantly, the smaller sample size is more appropriate for PLS-SEM analysis (Hair et al., 2021).

3.3 Instrumentation

The research utilized 34 measurement items from the existing literature. However, little alterations were made in the wording of the items to align them with an IT context (Latif et al., 2021; Shujahat et al., 2021). The questionnaire utilized a five-point Likert scale varying from "1" meaning "strongly disagree" to "5" meaning "strongly agree." Sources of measurement instruments are reflected in Table 1.

Table 1: Sources of Measurement Instruments (source: authors)

Variable	Dimension	No of Items	Source
Knowledge worker competence	Technical knowledge Adaptability of the employees Innovative practice Team workers among the knowledge workers Cooperation in the organization	06	Diaz-Fernandez et al., 2014
Knowledge worker productivity	-	07	Palvalin et al (2015)
Abusive Supervision	-	15	Tepper's (2000)
Digital Innovation	-	06	Paladino (2007)

3.2 Data Analysis Procedure

This study used the Smart PLS 4.0 software suite (Ringle et al., 2005). PLS-SEM includes multi-stage analysis: First, measurement model evaluation and second, structural model evaluation (Ringle et al., 2018; Wong, 2013). The measurement model requirement guarantees that the structural model will use only the constructs with good indicator loading, convergent validity, composite reliability (CR), and discriminant validity. Structural model evaluation is meant to evaluate path coefficients and test their magnitude through bootstrapping. Concerning mediation assessment, Preacher and Hayes (2008) technique was pursued as it is the more meticulous method to test mediating influences and is more suitable to use with the PLS-SEM technique. Most of the latest research in the KM field has engaged the PLS-SEM tool for data assessment (Sahibzada et al., 2020; Shujahat et al., 2019).

4. Results and Analysis

4.1 Measurement Model Assessment

The first phase evaluation of the measurement model was made accordingly to confirm the reliability and validity of the constructs and their dimensions (Hair et al., 2014). While evaluating the measurement model, no factors were removed because all the factor loading was above or close to the suggested value of 0.60. Therefore, all questions were involved in the decisive measurement model. Table II shows that all the factor loadings are higher than the suggested value of 0.60.

Likewise, the AVE and CR of all the concepts equal or surpass the suggested values of 0.50 and 0.70, respectively. Thus, convergent validity and reliability are developed. Table III shows the discriminant validity results (Fornell & Larcker, 1981).

Table 2. Item Loadings, Reliability and Convergent Validity (Source: authors)

	Λ	**α**	**CR**	**AVE**
Abusive Supervision		0.961	0.970	0.867
AS1	0.880			
AS2	0.952			
AS3	0.957			
AS4	0.946			
AS5	0.918			
Digital Innovation		0.968	0.974	0.860
DI1	0.933			
DI2	0.933			
DI3	0.935			
DI4	0.923			
DI5	0.918			
DI6	0.922			
Knowledge Worker Competence		0.966	0.972	0.853
KWC1	0.913			
KWC2	0.914			
KWC3	0.928			
KWC4	0.930			
KWC5	0.930			
KWC6	0.926			
Knowledge Worker Productivity		0.978	0.981	0.881
KWP1	0.939			
KWP2	0.945			
KWP3	0.944			
KWP4	0.932			
KWP5	0.944			
KWP6	0.939			
KWP7	0.929			

Table 3: Discriminant Validity (Fornell and Larcker Criterion) (Source: authors)

	AS	DI	KWC	KWP
AS	0.931			
DI	-0.897	0.908		
KWC	-0.906	0.827	0.924	
KWP	-0.910	0.77	0.901	0.939

Note: *The Data on the diagonal (in bold) is the square root of the AVE of the construct, while the other values are the correlations with other constructs. *P<0.001*

4.2 Structural Model Assessment

After the compulsory evaluation of the measurement model, the structural model test was evaluated in the second phase. The hypotheses were examined in sequence. First, the direct influence of AS on the KWP was analyzed. In the second phase, the direct influence of AS on KWC and KWC on KWP were analyzed. Then, the direct influence of KWP on DI was analyzed. A bootstrap resampling technique with 5,000 resamples (Ringle et al., 2005) was utilized to establish the significance of direct paths. Table 4 lists the test outcomes of hypotheses intended for direct associations. Lastly, the influence of AS on KWP via the intervention of KWC was tested. Table V shows the outcomes of the mediation assessment.

The results reveal a substantial negative influence of AS on KWP (β= -0.91, t= 12.77, p<0.001). Therefore, H1 was supported. Similarly, AS has a significant direct negative influence on KWC (β= -0.89, t= 37.89, p<0.001). Therefore, H2 is accepted. Moreover, the impact of KWC on KWP was found to be significant (β= 0.65, t= 29.11, p<0.001); hence H3 was substantiated. The results also acknowledge the significant direct and positive effect of KWP on DI (β= 0.94, t= 40.08, p<0.001). Therefore, H4 was accepted.

Table 4: Results of Structural Model path coefficient (Direct relationships) (source: authors)

Hypotheses	Relationship	Mean	SD	T statistics	P values	Decision
H1	AS -> KWP	-0.91	0.01	12.77	0.00	Supported
H2	AS -> KWC	-0.89	0.03	37.89	0.00	Supported
H3	KWC -> KWP	0.65	0.05	29.11	0.00	Supported
H4	KWP -> DI	0.94	0.01	40.08	0.00	Supported

4.3 Mediation Analysis

Lastly, H5 evaluates whether KWC mediates the association between AS and KWP. The outcome shows that with the mediator's introduction into the model, the total effect was negative but significant (β=.91, t= 79.64, p<0.001). Furthermore, the indirect effect was also significant (β= -0.55, t= 13.26, p<.001). Hence, the results reveal a partial mediation. This reveals that the influence of AS on KWP passes partially through knowledge worker competence. Consequently, H5 is accepted. The results of the mediation analysis are presented in table 5.

Table 5. *Summary of Mediation Results (source: authors)*

Total effect (AS->KWP)		Total indirect effect (AS->KWP)		Indirect Effects of AS->KWP				
Coefficient	**p-value**	**Coefficient**	**p-value**		**Coefficient**	**SD**	**T value**	**P Values**
-0.91	0.000	-0.58	.000	H5: AS->KWC->KWP	-0.55	0.04	13.26	0.000

5. Discussion and Implications of Study

This study investigated the impact of abusive leadership on knowledge worker productivity in the IT industry, directly and indirectly through knowledge worker competence. Using COR theory, we conducted a more in-depth analysis of how knowledge worker productivity impacts digital innovation within Pakistani IT companies and role of knowledge worker competency as a mediating mechanism to clarify the connection between abusive supervision and knowledge worker productivity.

5.1 Theoretical implications

The research work adds several theoretical contributions within the domain of abusive leadership and digital innovation. First, the study explores the relationship between abusive leadership and knowledge worker productivity. By examining the unexplored direct impact of knowledge workers' competence, we enhance the comprehension of the intricate relationship between abusive leadership and knowledge worker productivity in the digital era. This study presents empirical evidence suggesting that the presence of abusive leadership may lead to decreased productivity among workers, particularly in the IT industry. The results also support the COR theory proving that abusive supervision diminishes knowledge workers' resources.

Second, the study highlights the relationship between KWP and DI, showing how KWP can serve as a precursor of DI in IT organizations. This contribution builds upon the existing body of literature that primarily focuses on establishing the link between abusive leadership and employees' psychological outcomes such as employee satisfaction and motivation (Oubrich et al., 2021; Pellegrini et al., 2020). Previously, the study conducted by Gino and Staats (2015) revealed that knowledge workers who can concentrate in their tasks without any disruptions have a 10% increase in productivity and a 25% greater level of job satisfaction. Thus, higher the productivity and job satisfaction enhance the chances of digital innovation of worker in the organization. Thus, this study adds a significant contribution to the existing body of literature by examining the previously unexplored relationship between KWP and DI.

Third, the research underscores the complex interplay between knowledge worker competency and the relationship between AS and KWP. By examining the unexplored mediating impact of knowledge workers' competence, we enhance the comprehension of the intricate relationship between abusive leadership and knowledge worker productivity in the digital era. This study presents empirical evidence suggesting that the presence of abusive leadership may lead to increased productivity among workers, particularly when knowledge worker competence is taken into account as a mediating factor in the relationship. Consequently, this study contributes to the current corpus of knowledge by corroborating the adverse effects of abusive leadership on the productivity of knowledge workers. Aligning with the notion that employees' negative behaviors such as knowledge hiding (Fauzi, 2023) and workplace bullying (Kmieciak, 2024) usually caused by abusive supervision leads to lessening the productivity of employees. The empirical findings

of this study confirm that abusive supervision has a negative impact on knowledge workers' behaviors. Furthermore, the study provides valuable perspectives on the positive effects of knowledge worker competence (KWC). The negative effect of abusive supervision on the productivity of knowledge workers may be mitigated through the mediating function of KWC, thereby boosting digital innovation within the organization.

Lastly, the study incorporates COR theory, offering a dynamic framework for comprehending employee motivation and competence. Furthermore, it is theorized that individuals are driven to preserve their existing resources and seek additional ones. Our study is unique in its focus on analyzing the competence of knowledge workers in the IT industry. Our study clearly shows a strong link between AS and employees' green competence, leading to increased productivity of knowledge workers and enhancing the digital orientation of IT organizations.

5.2 Practical Implications

The research work has significant implications for managers in Pakistan's IT sector. First, the study highlights the negative role of abusive leadership on workers' knowledge productivity. This underscores the criticality of reducing instances of abusive supervision within the organization. To mitigate the harmful effects of abusive leadership, organizations should begin training managerial and executive staff in constructive and supportive leadership styles. The influence of organizational hierarchical levels, particularly the supervisor, on employee behavior can be positive or negative (Caputo et al., 2021). In addition, the study suggests that knowledge-intensive organizations should prioritize investing in training and development programs to enhance the competence of knowledge workers. This program can help knowledge workers acquire the necessary skills and knowledge to achieve their goals and increase productivity. One way to achieve this is by creating and facilitating collaboration and knowledge sharing among supervisors, subordinates, and peers (Xiong et al., 2021).

Second, this study provides IT organizations and managers with valuable insights by emphasizing the importance of nurturing knowledge workers' competence via supportive leadership and resources. According to the empirical findings, our study indicates that possessing distinct skills is increasingly crucial for employees engaged in IT-related organizational activities. IT organizations might consider investing in programs that support the development and enhancement of such abilities. The study recommends that organizations pay more attention to the

capability level of knowledge workers to enhance their productivity and innovative and creative abilities. It also assists knowledge workers in effectively managing an abusive supervisor that may hinder their productivity.

Third, enhancing knowledge workers' productivity and fostering digital innovation pose significant challenges for IT organizations. The study findings recommend that organizations implement reward and recognition programs to boost productivity among knowledge workers, which can drive digital innovation. This approach aims to inspire knowledge workers to maintain high performance levels and foster organizational digital innovation. Knowledge-intensive organizations ought to allocate resources towards technological advancements and provide their knowledge workers with current technological tools and resources to foster digital innovation and maintain a competitive edge in the marketplace through knowledge expansion (Tortora et al., 2021).

6. Conclusion

This research work aims to determine how abusive leadership negatively affects knowledge workers' productivity and its potential influence on digital innovation. The study further explores the mediating role of a knowledge worker's competence between abusive leadership and knowledge worker productivity. Building on the theoretical foundation of conservation resource theory (COR), data was collected from the knowledge workers in the highly knowledge intensive IT industry of Pakistan, a developing economy. The results revealed that abusive supervision significantly negatively impacts knowledge worker productivity, and the level of employee competence partially mediates the relationship between abusive supervision and knowledge worker productivity in a way that mitigates the negative impact of abusive supervision on knowledge worker productivity. This mechanism supports the notion that the competence level of knowledge workers enables them to communicate better, negotiate, and deal with their abusive supervisors effectively. This will diminish the negative influence of abusive supervisors and enhance knowledge worker productivity. The study also found that knowledge worker productivity has a significant positive impact on digital innovation. Knowledge worker productivity leads them towards a satisfied worker and is motivated to contribute to the organization. This study contributes substantially to the existing body of evidence on the productivity of knowledge workers and digital innovation by examining the interlocking effects of abusive leadership. It also implies the interpersonal mechanism of employee competence that connects abusive leadership

with the productivity of knowledge workers and digital innovation. Thus, this study is one of the first inquiries to analyze this paradigm.

6.1 Limitations and Future Research Direction

Like other studies, this research work has several limitations. Firstly, a comprehensive mediation model was utilized to investigate the association between AS and KWP using cross-sectional methodology. Using a time-lagged research design may result in varying outcomes in future investigations. A longitudinal research design has the potential to strengthen the evidence supporting the proposed theoretical model and facilitate the evaluation of alternative models. Secondly, the sample only represented one industry, which could restrict the findings' applicability to different contexts or industries. Subsequent investigations should consider selecting samples from diverse industries to comprehensively comprehend the phenomenon being examined. This may entail examining the suggested model in several countries or areas with diverse cultural backgrounds, labor laws, and economic conditions. Third, the study utilized a purposive sampling technique, which may have restricted the sample's representativeness. In future studies, researchers may consider utilizing a random sampling technique to enhance the sample's representativeness. This may entail recruiting participants from various organizations within Pakistan's IT sector or utilizing a national sample of knowledge workers. Finally, the study used the statistical analysis technique of partial least squares structural equation modeling (PLS-SEM). Future research may involve comparing the effectiveness of various statistical analysis techniques to validate the findings. One approach could be to utilize covariance-based structural equation modeling or other multivariate analysis techniques to validate PLS-SEM findings.

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