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Psychological contract fulfilment and innovative work behaviour: A mediated moderation model of work engagement and social support

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Abstract: This paper aims to research the impact of psychological contract fulfilment on employee innovative work behaviour, and the mediating role of work engagement and the moderating role of social support. A quantitative analysis was adopted to address in research. Two-wave data were collected from 332 respondents working in China. Hierarchical regression analyses were conducted to assess the proposed hypotheses. Results revealed that psychological contract fulfilment positively impacted innovative work behaviour. In addition, engagement partially mediated the relationship between psychological contract fulfilment and innovative work behaviour. Furthermore, the findings suggest that social support moderates the relationship between work engagement and innovative work behaviour, and, in turn, moderates the indirect effect of psychological contract fulfilment on innovative work behaviour through work engagement. This research extends the generalizability of findings in the psychological contract literature. The results bear significant implications for the management of employees' innovative work behaviour.

Keywords: psychological contract fulfilment; innovative work behaviour; work engagement; social support

1. Introduction

In the contemporary landscape, the intricate transformations stemming from technological advancements pose formidable challenges for organizations striving to thrive in a competitive market. These challenges exert pressure on organizations to reassess their methods, procedures, and policies (Azeem et al., 2021). Innovation serves as a pivotal tool for organizations to align their business models with the demands of a challenging environment (Oubaziz and Matmar, 2021). In this context, the proactive involvement of employees in the exploration, generation, and implementation of innovative ideas plays a crucial role (Janssen, 2000), as innovative work behavior (IWB) of employees contributes to enhancing organizational effectiveness and ensuring long-term survival (AlEssa and Durugbo, 2022; Pieterse et al., 2010). As a result, a crucial question for human resource management (HRM) research and practice revolves around how organizations trigger and stimulate employee IWB.

Employees' perceptions of the psychological contract emerge as a pivotal determinant in forecasting IWB (Agarwal, 2017; Chang et al., 2013; Karani et al., 2023; Ng et al., 2010). Furthermore, previous studies have indicated that psychological contract breach acts as an antecedent to IWB (Agarwal, 2017; Karani et al., 2023; Ng et al., 2010). Psychological contract, drawing from social exchange theory (SET), individuals' perceptions concerning the mutual obligations and responsibilities

between employees and employers (Rousseau, 1995), typically used to understand employees' reciprocal behaviours within employment relationships. SET proposes that social exchange involves interdependent interactions where the dominant emphasis was the actions of each party are dependent on the other. Thus, employees IWB will be affected by social exchange relationship. While previous empirical research has explored the influence of the psychological contract on employees IWB, the focus has predominantly been on the breach side, with limited attention given to the positive side, specifically psychological contract fulfilment (PCF).

In addition, discussions related to IWB focused on work engagement (WE), which is a psychological attachment embodied in employees devoting their energy, emotion, and physical resources to job roles (Kahn, 1992). WE traditionally derives from Kahn's (1990) concept of personal engagement and has been used as the conceptual basis for vast research (Christian et al., 2011). Prior research has indicated that the fulfilment of psychological contract is a key factor in determining WE (Yu, 2022). Additionally, according to Jason and S. N. (2021), WE serves as an antecedent of IWB since highly engaged employees are inclined to put in extra effort to propose innovative solutions to improve their competitiveness. Therefore, the potential influence of PCF on IWB may originally be shaped through the change of WE. However, previous studies on WE mainly focused on its role as an outcome of employees' attitudes and a predictor of performance, with limited academic attention on its mediating role. Given that addressing this gap may enhance comprehension of the mechanisms by which PCF influences IWB, this study aims to explore the mediating role of WE between PCF and IWB.

To further analyse the mechanisms of the relation proposed above, this research, building on job demands-resources (JD-R) theory, proposes that social support (SS) may moderate the indirect associations of PCF and employees' IWB through WE. As a job resource, SS initially referred to an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the wellbeing of the recipient (Shumaker and Brownell, 1984). Its specific definition follows from Hobfoll and Stokes (1988), those social interactions or relationships that provide practical assistance to individuals or create a sense of attachment to a person or group seen as caring or loving. When employees receive external feedback and instrumental assistance, these elements may be essential for task completion, ultimately fulfilling job requirements. This, in turn, has the potential to motivate individuals to engage in high-quality social reciprocity following the receipt of social support (Cropanzano and Mitchell, 2005; Jolly et al., 2021). In this sense, employees with a high level of support are more likely to offer a greater number of solutions and exhibit heightened creativity in the workplace. Thus, to further advance the current understanding of the mechanisms of PCF on IWB, we explore the moderating role of SS.

Given the above, this research intends to explore the underlying mechanisms of PCF and employees' IWB, by examining the mediating role of WE and the moderating role of SS (**Figure 1** displays the conceptual model). This research inventively proposes that the connection between PCF and IWB is mediated by WE, providing a profound empirical support for understanding employees' behavioural outcomes of innovation. Secondly, our research provides a novel lens to understand the underlying

employment relationships, as most of the existing research on psychological contracts within organizations on breach and consequences in employment relationships, with limited academic attention focused on the positive side of PCF. The novelty of this study also lies in the inclusion of SS based on the JD-R theory. Utilizing the buffering hypothesis and the bipolar perspective of burnout to elicit the moderating role of SS in WE and IWB. Although a large number of studies have demonstrated that SS is one of the important facilitating factors in WE (Carlson et al., 2021; Monica and Krishnaveni, 2019; Othman and Nasurdin, 2013; Toyama and Mauno, 2017) and in IWB (Nhat Vuong et al., 2022), its moderating role in WE and IWB has not been confirmed by research.

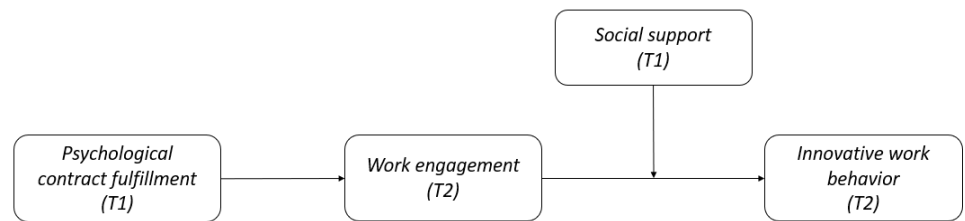


Figure 1. Conceptual model.

2. Theatrical background

The paper is theoretically underpinned by social exchange theory (SET) (Blau, 1964) and Job Demand Resource theory (JD-R) (Bakker and Demerouti, 2007). Dating back to the 1960s, the psychological contract had emerged (Argyris, 1960) and has become a vital analytical framework to understand the bilateral exchange relationship in employment. Rooted in SET, psychological contract refers to the individual's perception of the mutual obligations and responsibilities that exist between employers and employees (Rousseau, 1995). In SET, theorists agreed that social exchange involves interdependent interactions where each party's actions were contingent on the other (Cropanzano and Mitchell, 2005). These series of social interactions are guided by a general reciprocal norm to transfer mutual obligations and such obligations are not explicitly identified, meaning that when one individual "does another a favour ... while there is a general expectation of some future return, its exact nature is definitely not stipulated in advance" (Blau, 1964). Consequently, the social exchange relationships developed following the creation of the future obligations for each party to reciprocally give and receive inducements (Blau, 1964). Under SET, employers and employees always nest in a bilateral exchange relationship within an organization, in which employees have certain expectations from their employers. Once the employee's expectations were met, a positive fulfilment of psychological contracts emerges, and then employees will take reciprocal behaviours to re-balance the relationship. Grounded in the reciprocity norm, SET provides a framework using psychological contracts to study the reciprocal exchange existing in employment relationships and to understand how employees are likely to respond in accordance with their PCF (Gardner et al., 2021; Turnley et al., 2003). Therefore, the consideration of PCF, whose nature and quality are embedded in the employment relationship, logically points to SET.

As for JD-R theory, it was developed from the demand control model (Karasek,

1979) and the effort-reward imbalance model (Siegrist, 1996) based on the agreement of job characteristics theory (Hackman and Oldham, 1980) and resource conservation theory (Hobfoll, 1989). This theory discusses work in two groups of variables (i.e., job demands and job resources). Job demand is a sustained physical and/or psychological (cognitive and emotional) effort or skill from physical, psychological, social or organizational level and job resource refers to either/or of these levels (1) reduce job demands and the associated physiological and psychological costs; (2) are functional in achieving work goals; (3) stimulate personal growth, learning and development (Bakker et al., 2005; Schaufeli and Bakker, 2004; Wang et al., 2021). This theory is realised through a dual process which indicate a stress-based buffering path and a motivational process building on intrinsic and extrinsic nature (Bakker and Demerouti, 2007). In the former state, job resources work as a buffer when job demands affect job stress (Bakker and Demerouti, 2007; Bakker et al., 2005). For example, Schreurs and others (2012) demonstrated that supervisor support buffered work experienced strain and moderated the relationship between job insecurity and in-role performance. The path of motivation then implies that job resources are potentially in the fulfilment of work goals and the satisfaction of individual basic needs (Bakker and Demerouti, 2007). For instance, a study from Portugal (Orgambídez-Ramos and De Almeida, 2017) concluded that the impact of employee WE on job satisfaction was more significant when SS from co-workers was higher. That is, when employees receive outside feedback and instrumental help, this would probably satisfy exactly what they need or be a requisite for them to complete their tasks to eventually realize the demands of the job. Overall, the combination of social exchange theory and job demand theory enables individuals to be stimulated to produce high quality social reciprocity after receiving SS (Blau, 1964; Cropanzano and Mitchell, 2005; Jolly et al., 2021). Therefore, this study creatively integrates these two theories for hypothetical corollary and analysis.

3. Hypotheses

3.1. Psychological contract fulfilment and innovative work behaviours

Drawing on the SET, the existing research has provided ample evidence for the positive relationship between PCF and employees' work outcomes such as WE (Agarwal, 2014; Soares and Mosquera, 2019; Yu, 2022), organizational citizenship behaviours (Turnley et al., 2003), job autonomy (Noble-Nkrumah et al., 2022) among others. However, academic attention has been less devoted to IWB in psychological contract literature. Janssen (2000) defined IWB as the behaviour of employees to create, introduce, and apply new ideas intentionally at work, within a group or an organization with the intention of contributing to performance, consisting of idea generation, idea promotion, and idea realization. Based on the reciprocity norm, perceived fulfilment of psychological contract are instigators of the innovative behaviours of employees. According to Janssen (2000), the willingness of individuals to work innovatively depends on the quality of their social exchange with the organization, as IWBs are often resisted by those within the organization who want to maintain the status quo, which creates an emotional burden and social risk for innovative employees (Bolino and Turnley, 2005). As a result, if organizations fail to

fulfil contractual agreements commensurate with reciprocal norms, employees are likely to feel less bound to the relationship and less likely to initiate innovative behaviour.

In the limited literature on the psychological contract and IWB, most researchers explored the relationships from the breach perspective of psychological contract. For example, Ng et al. (2010) showed that increased perceptions of psychological contract breaches were associated with decreases in innovation-related behaviours from multiple industries in Asia. And Agarwal (2017) proved the negative relationship between psychological contract breach and IWBs in the Indian context. Barnhill and Smith (2019) examined the relationship between PCF and IWB, but they failed to prove that IWB is an outcome variable related to PCF in sport-based small business enterprises. Based on the above considerations, this research assumed that PCF positively impacts IWB.

H1: PCF is positively related to IWB.

3.2. Mediating role of work engagement

The term “engagement” was first introduced within an organizational context by Kahn (1990). Subsequently, Schaufeli et al. (2002) defined WE as “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption”, characterized by energetic, active, and enthusiastic in taking on challenges without being disturbed by the outside environment (Schaufeli and Bakker, 2004). Under SET, WE are a kind of response to the organizations in the reciprocal exchange once their psychological contracts or expectations were met. Put another way, employees are typically to increase the level of WE as a means of reciprocating when their expectations are met in the workplace. Indeed, a few studies have examined the inherent connection between PCF and WE and consistently pointed out that PCF is an essential determinant of WE (Agarwal, 2014; Karani et al., 2021; Soares and Mosquera, 2019).

Furthermore, WE is recognized as a motivational manifestation of IWB (Schaufeli et al., 2006). WE attributes to the positive mindset of engaged employees who are intrinsically motivated to achieve higher performance (Jason and S. N., 2021). Specially, as WE are endowed with the attributes of ‘vigor, dedication and absorption’, this positive state prompts employees actively performing better coping skills (Fredrickson, 1998) and developing innovative technique to achieve desired work goals (Hui et al., 2020). IWB is the key to the sustainability and survival of an organization in the marketplace (Ali et al., 2022), whilst this innovation and novelty is provided by engaged employees through involvement in their routine work (Mubarak et al., 2021). This means that highly engaged employees retain their enthusiasm and enjoyment for their work thus enabling them to react through positive emotions and intrinsic proactivity when facing challenges (Hui et al., 2020). Furthermore, according to Agarwal (2014), it is imperative for IWB to generate substantial and continuous processes from employees. Thus, given the nature of engagement concerning a more persistent affective-motivational state, rather than a momentary and specific state, engagement acts as a prerequisite for IWB.

According to Schaufeli (2003), positive psychological conditions for employees,

which in turn enhance WE and thus lead to IWB. Based on the above considerations, we propose the possibility that the potential influence of PCF on employees' IWB may originally be shaped through the change of WE. In prior research, limited study has discussed the mediating role of WE between PCF and employees' innovative behaviours. Chang et al. (2013) indicated that WE has a partial mediation effect between psychological contract and IWB. To compensate for the gap, we hypothesize the following:

H2: WE mediates the relationship between PCF and IWB.

3.3. Moderating role of social support

JD-R illustrates the process that these two interact with strain and motivation to output organizational-level outcomes (Bakker and Demerouti, 2007). On the one hand, SS is seen as coping resource to alleviate the negative effects of job demands (Gakovic and Tetrick, 2003). This is known as the buffering hypothesis and is linked to an individual's stress levels and negative psychological traits (Cohen and McKay, 1984), which explains why SS is commonly associated with low burnout and plays a quintessential moderating role (Halbesleben, 2006). Further, studies have contrasted the core concepts of burnout and WE, where the attributes such as exhaustion, cynicism, and inefficiency are conceptually opposed to the latter's vigour, dedication, and absorption (González-Romá et al., 2006; Langelaan et al., 2006). This distinct bipolar dimension has been tested (González-Romá et al., 2006) and mentioned together with SS (Halbesleben, 2006), personality (Langelaan et al., 2006), and job demand resource theories (Schaufeli and Bakker, 2004). There has been an empirical study of the relationship between burnout and IWB in a SS environment (Phan, 2019). Hence, this study proposes the possibility that the relationship between WE (the opposite of burnout) and IWB is also influenced by SS. Thus, we propose hypothesis 3 as follows:

H3: SS moderates the relationship between WE and IWB.

Additionally, according to the motivational assumption of the JD-R, when the work environment provides more resources, this change (e.g., leadership support and instrumental assistance) stimulates employees' willingness to engage in their work (Bakker and Demerouti, 2007). Also, this exacerbates the reciprocal relationship between the employee and the organization, allowing them to dedicate themselves to producing innovative goals in their work tasks (Agarwal, 2014; Blau, 1964; Cropanzano and Mitchell, 2005; Jolly et al., 2021). Working in a resource-rich environment, whether this straightforward support from colleague or superior, contributes to increased employee motivation and enthusiasm to engage in work (Jia et al., 2022; Karasek and Theorell, 1990), which further shapes employees' innovative behaviour (Nhat Vuong et al., 2022). Thus, we hypothesize the following:

H4: The indirect relation between PCF and IWB through WE is conditional on SS such that high level of SS tends to strengthen this indirect relationship.

4. Methodology

4.1. Sample and procedures

We collected two-wave data from several public and private sector organizations in China. As the original scales are in English, we translated the original scales into Chinese using a backward and forward translation approach (Hayashi et al., 1992), and then the Chinese version of the questionnaires went through a multi-step review and editing process by a professional translation agency. Prior to data collection, we contacted the management of these organizations to obtain approval and obtain informed consent from employees. Data were collected through paper-based version in two phases and returned in a sealed envelope after each phase is completed. A total of 500 employees (randomly selected) were invited to answer the questionnaire. At Time 1, we asked the participants of these organizations to answer the questions to provide their background information and assess their PCF and SS. A total of 387 (77.4% of response rate) out of a total of 500 questionnaires were received at Time 1. Time 2 (four weeks later), all Time 1 respondents were asked to answer questions to report their work engagement and innovative work behaviour, and 339 (67.8% of response rate) responded, out of which 332 were used for further analysis.

Among respondents, 45.6% were women and 54.4% were men. Employees between the ages of 18 and 30 accounted for nearly half of the sample. Statistics on educational level showed that 56.78% of the employees had a bachelor's degree and 15.02% had a master's degree and higher qualifications. In addition, half of the sample group had five years of experience or less. 6–10 years and 11–15 years of experience were found in 20.51% and 15.38% of the total respectively. Only 13.19% had 16 years of experience and above.

4.2. Measures

Respondents were asked to use a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree) to evaluate their level of agreement with all the measures.

Psychological contract fulfilment: 4 items extracted from Robinson and Morrison (2000) to measure PCF. The coefficient α was 0.845.

Innovative work behaviour: A total of 4 items adopted from Janssen (2000) to measure IWB. The coefficient α was 0.842.

Work engagement: 4 items cited from the simplified version of Utrecht Work Engagement Scale (UWES) (Schaufeli and Bakker, 2004) to assess WE. The coefficient α was .841.

Social support: To measure SS, we extracted 3 items from Karasek et al. (1982). The coefficient α was 0.717.

Control variable: We controlled for employees' gender (Coding: 1 = male; 2 = female), age (Coding: 1 = 18–30; 2 = 31–40; 3 = 41–50; 4 = 51 or above), educational level (Coding: 1 = senior high school or below; 2 = college; 3 = university; 4 = postgraduate or above), and tenure (Coding: 1 = less than 5 years; 2 = 6–10 years; 3 = 11–15 years; 4 = over 16 years) since these demographic variables may influence employees' IWB.

5. Analyse and results

5.1. Confirmatory factor analyses

We utilized SPSS version 23 and AMOS 24 to conduct the analysis procedure aimed at assessing the validity and reliability of the constructs as well as evaluating the proposed model. Considering cultural differences in the scales, exploratory factor analysis (EFA) was conducted prior to confirmatory factor analysis (CFA). The results reported that the value of KMO is 0.865, exceeding the threshold of 0.7, and Bartlett’s test of sphericity is significant (Sig. < 0.05). In addition, **Table 1** presents the outcomes of the component matrix following rotation, indicating a 4-factor solution, consistent with the proposed model.

Table 1. Component matrix after rotation.

Variables	Items	Component			
		1	2	3	4
PCF	PCF4	0.836	0.117	0.031	0.103
	PCF2	0.805	0.157	0.157	0.130
	PCF1	0.781	0.245	0.059	0.018
	PCF3	0.769	0.150	0.158	0.071
IWB	IWB3	0.186	0.797	0.143	0.017
	IWB2	0.095	0.789	0.146	0.084
	IWB1	0.200	0.784	0.207	0.032
	IWB4	0.199	0.782	0.146	0.077
WE	WE2	0.045	0.109	0.796	0.188
	WE1	0.228	0.238	0.787	0.043
	WE3	0.051	0.132	0.786	0.108
	WE4	0.115	0.183	0.782	0.189
SS	SS1	0.064	0.021	0.124	0.799
	SS3	0.032	0.173	0.164	0.796
	SS2	0.161	-0.015	0.133	0.744

To establish convergent and discriminant validity of the proposed model, we conducted CFA on the four-factor model (PCF, IWB, WE, and SS) of the proposed model. **Table 2** shows that all constructs and indicators meet recommended threshold values ($\chi^2 = 104.693$, $\chi^2/df = 1.246$, GFI = 0.961, CFI = 0.989, RMR = 0.040; RMSEA = 0.027). Additionally, we compared the four-factor model with three three-factor models and one single-factor model. The results in **Table 2** demonstrate that the proposed four-factor model outperforms all nested two-factor models and the single-factor model in terms of model fit indices. Therefore, the convergent and discriminant validity of the proposed model is established.

Moreover, all standard factor loadings (SFL) exceeded 0.7, and the combined reliability (CR) values for all scales surpassed 0.7 (see **Table 3**). Additionally, the reported values for average variance extracted (AVE) were above 0.5, confirming the establishment of good internal consistency and adequate convergent validity in this research.

Table 2. The Results of CFA.

Model	χ^2	χ^2/df	GFI	CFI	RMR	RMSEA
Four-factor model	104.693	1.246	0.961	0.989	0.040	0.027
Three-factor model: PCF and WE combined	536.482	6.166	0.757	0.769	0.108	0.125
Three -factor model: WE and SS combined	251.590	2.892	0.904	0.916	0.063	0.076
Three -factor model: WE and IWB combined	441.263	5.072	0.785	0.818	0.093	0.111
Single-factor model: PCF, WE, SS, and IWB combined	922.648	10.525	0.654	0.573	0.134	0.167

Table 3. Loadings, composite reliability, and average variance extracted.

Scales	Items	SFL	CR	AVE
PCF	Almost all the promises made by my employer during recruitment have been kept so far	0.755	0.846	0.579
	So far, my employer has done an excellent job of fulfilling its promises to me.	0.802		
	I feel that my organization has fulfilled the contract between us.	0.722		
	I feel satisfaction by how I have been treated by my organization.	0.763		
IWB	Introducing innovative ideas into the work environment in a systematic way	0.760	0.844	0.575
	Searching out new work methods, techniques or instruments	0.764		
	Generating original solutions for problems	0.714		
	Transforming innovative ideas into useful applications	0.792		
WE	At my work, I feel that I am bursting with energy	0.797	0.842	0.573
	At my job, I feel strong and vigorous	0.739		
	I am enthusiastic about my job	0.704		
	I am immersed in my work	0.783		
SS	Supervisor encourages those he supervises to exchange opinions and ideas	0.759	0.792	0.559
	Supervisor offers new ideas	0.719		
	Coworkers help solve job-related problems	0.764		

5.2. Descriptive statistics and correlations

Table 4 displays the means (*M*), standard deviations (*SD*), and correlations of measures. As anticipated, PCF exhibited a positive correlation with IWB, WE, and SS. In addition, SS positively linked with IWB and WE.

Table 4. Means, standard deviations, and correlations among variables.

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1 Gender	1.48	0.500	1							
2 Age	1.90	1.111	-0.043	1						
3 Education	1.61	0.881	-0.001	-0.016	1					
4 Tenure	2.54	1.092	-0.009	0.030	0.015	1				
5 PCF	4.039	0.837	-0.211**	-0.005	-0.018	0.018	1			

Table 4. (Continued).

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
6 WE	3.702	0.911	-0.124*	0.023	0.046	0.029	0.300**	1		
7 SS	3.999	0.847	-0.580**	0.025	0.012	0.046	0.418**	0.414**	1	
8 IWB	4.081	0.734	-0.133*	-0.026	-0.038	0.033	0.234**	0.352**	0.187**	1

Note: * $p < 0.05$; ** $p < 0.01$ (two-tailed).

5.3. Hypotheses testing

Direct and mediating effects

Hierarchical regression analyses were conducted to assess the proposed hypotheses, and the findings are detailed in **Table 5**. According to model 3, PCF exhibited a positive relationship with IWB ($\beta = 0.313$, $p < 0.01$), thereby supporting H1.

Table 5. Results of hierarchical regression analysis.

Direct and mediating variables	WE		IWB				
	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>M4</i>	<i>M5</i>	<i>M6</i>	<i>M7</i>
Control variables	3.871	2.442	5.354	3.922	3.277	3.327	3.798
1 Age	0.014	0.018	-0.001	0.003	-0.002	0.004	-0.001
2 Gender	-0.223	-0.113	-0.982	-0.872	-0.842	-0.864	-0.852
3 Education	0.047	0.053	0.010	0.016	0.002	0.017	0.020
4 Tenure	0.022	0.018	0.031	0.027	0.023	0.026	0.027
Independent variable							
PCF		0.312**		0.313**	0.230**	0.302**	0.324**
Mediator							
WE					0.264**		
Moderator and interactor							
SS						0.056**	0.018**
WE * SS							0.091**
ΔR^2	0.006	0.083	0.330	0.421	0.493	0.421	0.425
R^2	0.018	0.097	0.338	0.430	0.502	0.432	0.437
<i>F</i>	1.535	7.016**	41.787**	49.090**	54.665**	41.150**	35.946**

Note: * $p < 0.05$; ** $p < 0.01$; two-tailed tests.

To assess the mediating effect of WE, we conducted a bootstrapping analysis (5000 times) following the method proposed by Preacher et al. (2007). In **Table 6**, the 95% bootstrap confidence intervals for the indirect effect of WE are presented. The results indicate a significant indirect effect of WE on IWB ($\beta = 0.083$, 95% CI = [0.040, 0.136]), providing further confirmation for H2.

Regarding H3, the hierarchical regression analyses affirmed the moderating effect of SS between WE and IWB. The outcome of model 6 in **Table 5** reveals that the interaction between these two variables had a significant effect on IWB ($\beta = 0.091$, $p < 0.01$). To elaborate on the interaction effect, a simple slope analysis was conducted and is displayed in **Figure 2**.

Table 6. Mediating effect of work engagement.

	Effect	Se	t	p	LLCI	ULCI
Total effect	0.313	0.043	7.222	0.000	0.228	0.398
Direct effect	0.230	0.042	5.452	0.000	0.147	0.314
Indirect effect	0.083	0.025	-	-	0.040	0.136

Note: * $p < 0.05$; ** $p < 0.01$; two-tailed tests.

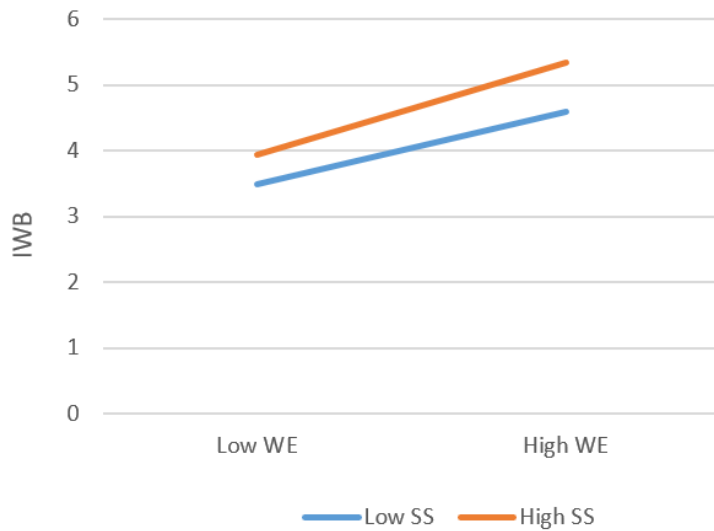


Figure 2. Moderating effect of social support.

To assess H4, we conducted mediated moderation analyses following Hayes’ (2013) approach, employing bootstraps (5000 times) to calculate the indirect effect of PCF on IWB at conditional values of SS. **Table 7** reveals that the mediating effect was moderated by SS ($\beta = 0.022$, 95% CI = [0.036, 0.075]). Specifically, in the high SS group, WE mediated the relationship between PCF and IWB with a substantial indirect effect size ($\beta = 0.101$, 95% CI = [0.042, 0.169]). In contrast, in the low SS group, the indirect effect was smaller ($\beta = 0.085$, 95% CI = [0.006, 0.143]). Thus, H4 received support.

Table 7. Conditional mediation effect of social support on innovative work behaviour through work engagement.

Social support	Effect	BootSE	BootLLCI	BootULCI
High (+1 SD)	0.101	0.033	0.042	0.169
Low (-1 SD)	0.085	0.027	0.006	0.143
Mediated moderation effect	0.022	0.027	0.036	0.075

6. Discussion

6.1. General findings

This research, drawing on SET and JD-R, tested the impact of PCF on employees’ IWB, by a mediated moderation path analysis of WE and SS. In summary, the hypotheses presented in this study were all supported, which is in overall agreement with the findings of the literature reviewed above.

Hypothesis 1 was supported that the PCF positively impacted employees' IWB (Barnhill and Smith, 2019). It is explained that employees generate, promote, and realize ideas that lead to innovative work behaviour when their expectations of the organization are fulfilled. Based on the results, it is reasonable to assume that when organizations provide a situation (e.g., working from home, welfare policies) that fits the desires of their employees, positive psychological contracts are formed so that employees generate new ideas and gradually enhance their application to the workplace resulting in creative outcomes. Second, the supported hypothesis 2 suggests that WE mediated the relationship between PCF and IWB (Chang et al., 2013; Schaufeli, 2003). To elaborate, a fulfilment state of psychological contact for employees enhances WE and in turn lead to IWB. Thus, the potential influence of PCF on employees' IWB may originally be shaped through the change of WE. Additionally, our results suggest that SS moderates the relationship between WE and IWB (H3). In fact, there has been an empirical study confirmed the moderating effect between burnout (the opposite of WE) and IWB (Phan, 2019). Furthermore, the findings support H4, indicating that SS moderates the indirect effect of PCF on IWB through WE. In other words, the indirect relationship between PCF and IWB through WE are conditional on SS, such that a high level of SS tends to strengthen this indirect relationship.

6.2. Theoretical contributions

Our article contributes to several aspects of the theories. Firstly, we confirmed that employees' psychological contracts have a positive effect on IWB from a social exchange theory perspective. Historical literature also suggests that the theme of the psychological contract is always inseparable from the mutual commitment and trust between the employee and the employer (Karani et al., 2022). We build on this by applying SET to the positive side and linking it to WE and IWB, although some studies have either looked at the relationship between WE and IWB (e.g., Agarwal, 2014; Jason and S. N., 2021; Jia et al., 2022), or focused on the effect of PCF on WE (e.g., Bal et al. (2013); Gordon (2020); Rayton and Yalabik (2014)), or emphasized different dimensions of the psychological contract (e.g., Agarwal, 2017; Chang et al., 2013; Hanif and Khan, 2016; Ng et al., 2010).

In addition, we introduced WE and SS as mediating and moderating variables respectively and explained their relationships through JD-R theory. Using the propositions from the JD-R theory (Bakker and Demerouti, 2007), this article is trying to explain how SS plays a moderating role in the relationship between WE and IWB. SS as a job resource provided by colleagues or superiors tends to play a buffering role against burnout (Bakker and Demerouti, 2017). Due to the conceptual polarization of burnout and WE (González-Romá et al., 2006) and the relevance of burnout, WE and IWB (Phan, 2019), we verified SS also play a strengthen role in WE and IWB. This fills in the gap, compared to the previous view of SS as a predictor of WE in the literature (Monica and Krishnaveni, 2019; Othman and Nasurdin, 2013; Toyama and Mauno, 2017).

6.3. Managerial implications

As for the practical implications, the results firstly proved that PCF as predictor of IWB. The psychological contract is the channel to realize the promise of an employment relationship based on mutual trust. For example, organizations should constantly consider the negative feedback and legitimate requests given by employees, provide the matching resources and build a conducive working environment to motivate them to be involved and innovative. That is, taking steps to meet employees' expectations and then build a solid psychological contract bridge. This focus is beneficial in enhancing the creative performance of employees whilst strengthening the competitiveness and vitality of the organization in the labour market (Bannay et al., 2020).

Moreover, the results proved that PCF trigger employee IWB through WE. Thus, work engagement was also suggested as a key focus for organizations to improve their innovation capabilities. This is consistent with previous research (Jia et al., 2022) with the interpretation that work engagement motivates employees to bring about creative work. Employers need to be aware of the importance of employee innovation and engagement to avoid organizational stagnation. Consequently, we recommend that managers should satisfy the psychological needs of group members in order to encourage employees to engage in their work and enhance their own creative behaviour and further contribute to the development of the organization.

Third, the result showed that SS moderates the relationship between WE and IWB, in turn moderates the indirect effect of PCF on IWB. Social support is recognized as a job resource that enables individuals to be motivated to reciprocate the benefits of a supervisor or co-worker and to establish high quality social exchange relationships (Jolly et al., 2021). Thus, on the one hand, organizations should pay attention to the role of managers in the allocation of resources to ensure that resources given to subordinates are reciprocated and converted into higher levels of employee engagement and innovation. On the other hand, employees should utilise their relationships with colleagues in the association to make more rational application and conversion of resources for both parties to achieve a win-win situation.

6.4. Limitations and future research

There are undeniable limitations. Firstly, this study concerns constructs insights mainly from the employees' own assessment. The criteria for the level of engagement and innovation in the work are derived from self-reporting. In other words, the degree to which work behaviour is innovative and participatory is determined by the subjective consciousness of the individual employee. Future analysis and studies should cover the assessment dimensions of superiors and colleagues to maintain better objectivity. Second, the data from both public and private sector organizations were collected, however, this study did not conduct a comparative analysis. Given the potential variations in psychological contract dynamics among employees in these distinct organizational settings, future research is encouraged to undertake comparative studies between public and private organizations. Third, the study was implemented in a collectivist environment in China. The individual traits of selflessness, solidarity, and team belonging fostered by collectivism (Chen et al., 2020;

Le et al., 2020) also emerged as potential influencing factors for the threading of SET. It is expected that future studies incorporate different scopes into the PCF and IWB models for further testing.

7. Conclusion

In sum, the present research, drawing on SET and JD-R theory, examines the effects of PCF on employees' IWB, as well as the mediating role of WE and the moderating role of SS. Results revealed that PCF positively impacted IWB. In addition, WE partially mediated the relationship between PCF and IWB. Furthermore, the findings suggest that SS moderates the relationship between WE and IWB, and, in turn, moderates the indirect effect of PCF on IWB through WE.

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