

Home-Based Telework in Information Technology Companies: Testing of the Effect of Family Supportive Supervisor Behavior and Gender on Employee Innovation

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Home-based telework (HBT) is not new, but has rapidly evolved since the start of the COVID-19 pandemic. The effectiveness of telework or “work from home” remains controversial among researchers, while the relationship between HBT and employee innovative behavior (EIB) has not received sufficient attention. Relying on resource conservation theory, social exchange theory, and cognitive-emotional systems theory, a chain mediation model of HBT on EIB was constructed with perceived organizational support (POS) and perceived insider status (PIS) as mediating variables. HBT may cause the blurring of work-family boundaries and female employees tend to devote more energy to family life, and so the three-order moderating effect of family supportive supervisor behavior (FSSB) and gender was also examined. We found that HBT has a positive effect on EIB based on data from home-based workers in 12 Chinese information technology companies. Also, POS and PIS play separate as well as chained mediating roles in this relationship. Notably, there are gender differences in the moderating effect of FSSB on the relationship between HBT and EIB where FSSB positively moderates the relationship only among male employees.

Keywords: home-based telework, employee innovative behavior, perceived organizational support, perceived insider status, family supportive supervisor behavior, information technology

Globalization, digital development, and demographic changes have fundamentally changed the nature of work in organizations. The development of internet platforms has provided the technological basis for effective working from home in numerous occupations, and work virtualization applications and intelligent co-working have restored the office work scenario (Liu, 2020). The COVID-19 pandemic has helped remove many of the organizational barriers that were limiting the development of telework and helped increase corporate investment

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in information technology infrastructure, both of which have driven more widespread adoption of telework (Fana et al., 2020).

Information technology has become an integral part of the office environment, the physical location of the workplace has gradually lost its importance, and telework is gradually becoming an important part of modern human resource practices (Nakrošienė, Bučiūnienė, & Goštautaitė, 2019; Gajendran, Harrison, & Delaney-Klinger, 2015). Telework refers to a work arrangement in which employees are outside the office and use information and communication technology (ICT) to stay in touch with their supervisors and colleagues and to complete work tasks (Ollo-López, Goñi-Legaz, & Erro-Garcés, 2021). Generally, it can occur in several ways, such as home-based telework (HBT), mobile telework, telework in small offices, and telework in shared facilities (Burrell, Johnson, Shufutinsky, & Ramjit, 2021). After the normalization of the COVID-19 pandemic, HBT became much more widespread. HBT is a work arrangement that allows employees to use ICT to complete work tasks at home during certain times of the workday (Bailey & Kurlund, 2002). HBT not only has the characteristics of teleworking but also considers the need for work-family balance to a certain extent.

Many real economies are struggling with logistics disruptions, labor shortages, and raw material shortages due to the pandemic. Continuous innovation is the main survival rule for enterprises, while organizational innovation originates from employee innovation. Employee innovative behavior (EIB) is extra-role behavior in which employees generate innovative ideas or problem solutions and actively apply them to practical organizational activities during the work process (Shin, Yuan, & Zhou, 2017). Scholars have conducted significant research on employees' innovative behavior from the aspects of leadership style, organizational innovation climate, and personal traits, and they have proposed management suggestions to stimulate EIB in terms of organizational harmony, idiosyncratic deals, and psychological skills (Fan, Ma, & Cui, 2021; Su & Liang, 2021; Wang & Gao, 2021). However, there is still insufficient research on the impact of the increasingly popular HBT, a flexible form of work, on innovative behavior. HBT as a differentiated resource satisfies employees' sense of self-fulfillment and increases their perceived insider status (PIS) by enhancing their perceived organizational support (POS), which leads to increased organizational citizenship behavior (Qi, Liu, & Lin, 2017). POS is the overall perceptions and beliefs that individuals subjectively perceive from organizational support, including how the organization views their contributions and whether it cares about their interests (Eisenberger, Huntington, Hutchison, & Sowa, 1986). Social exchange theory suggests that employees will engage in positive behaviors that benefit the organization, such as innovative behavior, when they perceive that the organization is supportive of them. Nevertheless, the impact mechanism between HBT and employees' innovative behavior needs to be further clarified.

The new generation of "post-90s" and "post-00s" employees in China who grew up with the Internet have increased their self-awareness compared with their parents' and grandparents' generations. These young people pay more attention to their personal values and the meaning of their work, and many are eager to improve their abilities at work. Therefore, traditional human resource management with the goal of consistency and standardization cannot meet the differentiated work needs of employees (Lv, Fan, Ma, & Yan, 2020). As a personalized and non-standard work arrangement, telework breaks the original stereotypical, fixed, and single-mode work relationship in human resource management, and it may break through the previous model of providing homogeneous employment terms for employees in similar positions, extend work flexibility to the life domain, and open up a new direction for studying work-family balance (Liu, 2020). Telework often provides employees with great freedom in terms of working hours and location, increasing job autonomy and flexibility,

and employees are usually free to coordinate work and personal matters, thus potentially reducing role conflict (Gómez, Tirado, & Martínez, 2020). It has been found that telework enables employees to be more productive by removing them from the office and avoiding the distractions of colleagues (Thulin, Vilhelmson, & Johansson, 2019). However, some scholars argue that telework separates employees from society and does not necessarily increase productivity (Jackson & Fransman, 2018), creating a tension between productivity and social cost management (Gajendran et al., 2015). At the same time, the practical flexibility of working hours and locations, which lacks clear boundaries between work and life, may prolong the working day (Morosan-Danila, Claudia-Elena, & Bordeianu, 2021). Therefore, the balance between work tasks and family responsibilities might become one of the most important challenges for teleworkers (Nakrošienė et al., 2019).

Family supportive supervisor behavior (FSSB) refers to behaviors exhibited by supervisors to support employees in fulfilling their family responsibilities and include four dimensions: emotional support, instrumental support, role modeling behaviors, and innovative work-family management (Ma et al., 2016). Supervisors help employees find ways to balance work and life, which helps employees develop a positive attitude toward work (Talukder, Vickers, & Khan, 2018). When employees perceive that their supervisors care about their family life and personal interests, there is also a stronger social exchange relationship that facilitates the generation of positive behaviors to improve personal and organizational performance (Rofcanin, Jong, Heras, & Kim, 2018). The impact of gender on HBT efficiency is ambiguous because stereotypical gender roles suggest telework would be more advantageous for women, yet it may increase men's involvement in family life thus potentially alleviating existing work-family conflicts (Mokhtarian, Bagley, & Salomon, 1998; Nakrošienė et al., 2019). Therefore, this study introduces the concept of gender to explore the role of FSSB and different role behavior expectations jointly influencing HBT.

Internet and information technology companies are more likely to be early adopters of HBT because they may already have the technical knowledge and infrastructure, and so this study takes the HBT employees of Chinese Internet and information technology companies as the survey objects to study whether HBT affects employees' innovative behavior. We also explore whether POS and PIS play an intermediary role in the above relationship, and whether FSSB and employee gender moderate the relationship. Next, a literature review of the variables involved in the research model and their relationships is presented, and then the research methodology and data analysis process are described. Finally, the findings and implications for management practice are discussed and we conclude with clarification of limitations and directions for future research.

Theoretical Background and Hypotheses

Home-Based Telework and Employee Innovative Behavior

Our research focuses on teleworkers who have an employment contract with an organization and perform some or all their work from home during work or non-work hours. Previous research has confirmed that HBT brings many advantages to employees, organizations, and society, such as more freedom in employee time management, increased family and rest time, reduced non-functional communication in the workplace, increased job satisfaction, reduced commuting time, and improved social issues such as decreased traffic flow and air pollution (Nakrošienė et al., 2019). HBT and other virtual and flexible work arrangements enhance the experience of employee autonomy, further influencing key employee outcomes (Gajendran & Harrison, 2007). While workplace flexibility provides the means to respond to the rapid changes in today's workforce, increases employee productivity, and reduces employee turnover and absenteeism (Ollo-López et al., 2021). Social

exchange theory suggests that employees with flexible work agreements develop a stronger sense of obligation to the organization.

The research model developed through the following assessment of the existing research is portrayed in Figure 1. A key assumption throughout is that EIB is positive for organizations, and particularly for the Internet and information technology companies that are the basis for this research. The terms and relationships in this figure should become clear in the following pages.

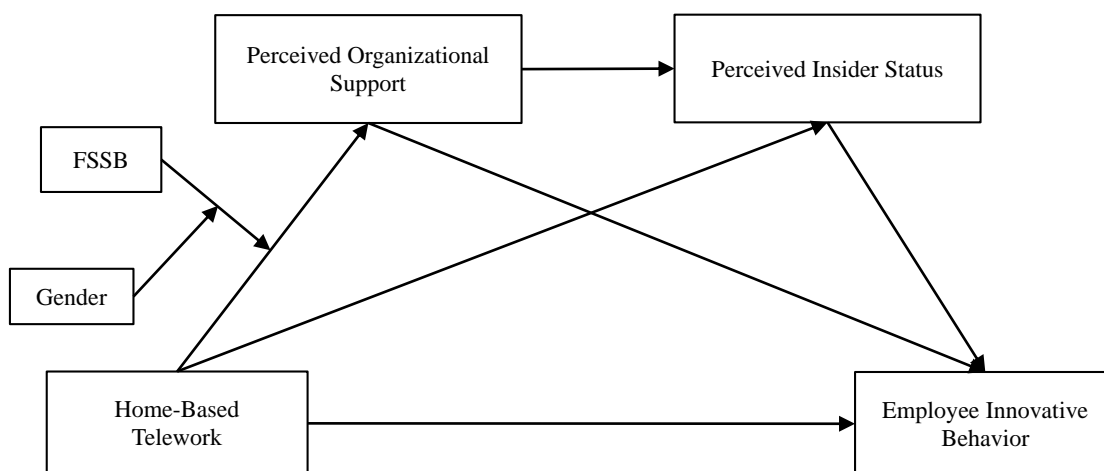


Figure 1. Research model.

In the HBT environment, employees will improve their task performance to fulfill this obligation and may also exhibit more active organizational citizenship behaviors (Greenberg, Roberge, Ho, & Rousseau, 2004). The knowledge and skills employees acquire from family life may prompt new ideas, and the positive emotions given to employees by their families largely influence their willingness to innovate, which stimulates innovative behavior (Liu et al., 2019). The positive emotions given to employees by their families help them expand their cognitive range, which stimulates them to generate more cognitive resources when thinking at work and also promotes the interconnection and recombination of different factors, which is conducive to the formation of creative thinking (Van Steenberg, Kluwer, & Karney, 2014). According to Nakrošienė et al. (2019), the suitability of the workplace at home is an important resource for increasing productivity and satisfying telework. The favorable atmosphere of HBT can influence employees' work through positive emotional and cognitive approaches, which enhances employee work creativity (Zhang, Cai, Fu, & Li, 2020).

Home-based teleworkers need to have better self-management skills and are more likely to be "high value" employees or outstanding performers in the organization, and such employees will also have challenging work assignments (Rosen, Slater, & Johnson, 2013). Creativity is mainly influenced by domain skills, creativity skills, and task motivation. Organizations empowering high-value employees with telework resources and opportunities develop these employees' business knowledge, skills, and abilities, and these skills will enhance individual creativity (Amabile, 1996). Resource conservation theory suggests that individuals instinctively and spontaneously pursue and absorb supportive resources for development and advancement (Tao, Han, & Zhang, 2019). HBT frees employees' cognitive resources from some non-work-related issues, gives them more discretion and control over their work, and uses more of their emotional and psychological resources for innovative thinking (Wang, Liu, & Shalley, 2018). Employees have increased job autonomy and access to supportive resources,

which enables individuals to give full play to their subjective initiative and more easily stimulate innovative thinking and behavior, and reduces job stress in the innovation process and enhances innovation self-confidence (Gu, Zhou, & Peng, 2014). HBT may provide employees with personalized situational characteristics that meet their individual needs, increase the possibility of adding value to the resource spiral, generating positive emotions, and inducing positive behaviors (Zhao, Huang, Chen, & Zhang, 2018; Liao, Wayne, Liden, & Meuser, 2017). HBT is also a pathway for high-value employees to try out new work methods and models because of the increased autonomy, which not only helps to stimulate innovative behavior in individual employees but also contributes to structural optimization within the organization (Kimwolo & Cheruiyot, 2020). Studies on idiosyncratic deals also indicate that personalized, non-standard work arrangements have a positive effect on EIB (Lv et al., 2020). Based on this, we propose:

Hypothesis 1 (H1): HBT positively influences EIB.

The Mediating Role of Perceived Organizational Support

Employees, based on the HBT environment, get a variety of supportive resources (e.g., emotions, time, and energy) at home and will continue to learn new knowledge and skills to meet work requirements (Shi, Wan, & Cui, 2015). High levels of family resources make employees deplete less of their own resources to fulfill the family role and devote more resources to the work area, so as to further develop their ability in work (Tao et al., 2019). Employees who work remotely from home perceive more organizational support and attention than other colleagues, and the “better-than-average” effect enhances employees’ POS (Zhang & Wub, 2019). Social exchange theory is a good explanation for employment relationships, and HBT is a flexible, non-standardized employment relationship based on the self-interest of both parties (West & Turner, 2010). HBT signals to employees that the organization is investing in their career growth and development, trusts them, and is concerned with their work and life needs (Liu et al., 2013). Employees increase their positive perceptions of organizational relationships when they accept HBT and this has an impact on work behavior (Satvir & Prajya, 2018).

A higher POS can stimulate EIB. Firstly, EIB is influenced by both individuals and organizations, and innovation requires organizational support and recognition in addition to individual initiative (Odoardi, Montain, Boudrias, & Battistelli, 2015). Organizations can create an innovative environment and provide innovative resources for employees, which can motivate employees to take on innovative activities (Zhan & Li, 2020). Meanwhile, the new generation of employees advocate the pursuit of freedom and are more proactive in innovation due to the era in which they were raised, but they are more likely to be negative if they do not receive support from the organization (Zhan, Yang, & Luan, 2017). Secondly, employees’ POS can meet employees’ socio-emotional needs such as respect, belonging, and emotional support, which further stimulate their positive work attitude and increase their motivation to innovate (Bosset & Bourgeois, 2015). Based on social exchange theory, employees are more likely to generate innovative and extra-role behaviors as they undertake developmental tasks within the organization to increase organizational efficiency and improve organizational performance (Zhao & Zhang, 2019).

Innovation activities may be risky, unstructured, non-processed, and unconventional, and thus employees engaged in innovation face a variety of pressures from inside and outside the organization. Organizational support reduces employees’ job stress, creates an intimate organization-employee relationship, and reduces employees’ perceptions of the risk and uncertainty around innovation. HBT provides employees with resources such as job autonomy and life assistance, and the innovation-supportive environment perceived by employees increases their

likelihood of using supportive resources for innovation. In addition, employees develop a good organizational image when their proactive innovation behaviors are valued by the organization and when innovation failure is supported by the organization rather than penalized, which further enhances employees' motivation to innovate (Chen, Fan, & Li, 2018). Finally, organizational support mobilizes employees' positive emotions, and according to the expansion-construction theory of positive emotions, positive emotions can make employees' thinking patterns more flexible and creative, thus constructing lasting personal resources and exhibiting more innovative behaviors. Based on this, we propose:

Hypothesis 2 (H2): HBT enhances EIB by positively influencing POS.

The Mediating Role of Perceived Insider Status

PIS is self-perception of an employee's personal space, status, and acceptance in an organization (Stamper & Masterson, 2002), and it is an individual's judgment of his or her "identity" in a specific context (Chen, Liao, Wu, & Zhang, 2017). HBT has a positive effect on PIS. Firstly, when HBT meets the employee's job needs or expectations, employee compatibility with the organization increases and employees see themselves as part of the organization internally. Secondly, as a differentiated employment arrangement between the organization and the employee, HBT establishes a psychological contract where the organization satisfies the employee's conditional need to create value and the employee is included in the organization to form a PIS. Thirdly, research on idiosyncratic deals suggests that HBT is used as an exchange resource that can help employers attract, motivate, and retain high performing employees, which sends an important signal to employees that they are valued and trusted by the organization (Rosen et al., 2013).

A high level of PIS leads to a strong perception of group identity, which role theory suggests would lead to positive extra-role behaviors. Firstly, under the influence of Chinese collectivist culture, employees with a high level of PIS perceive collective interests as higher than individual interests and are more willing to take the initiative to use the supportive resources given by the organization for innovation (Wang & Zhu, 2014; Liu, Li, & Zheng, 2018). Secondly, the higher the level of PIS, the higher the employees' sense of belonging to the organization, thus inspiring employees to engage in innovative behaviors (B. J. Kim, Chang, & T. H. Kim, 2018). Similarly, when employees perceive that they are accepted and have a certain status within the organization, this stimulates their innovative behavior (Stamper & Masterson, 2002). Thirdly, self-perception as an insider is a key factor influencing EIB and this positive self-perception spurs employee creativity (Wu, Liu, Wang, & Feng, 2016). Based on this, we propose:

Hypothesis 3 (H3): HBT enhances EIB by positively influencing PIS.

The Chain Mediating Effect of Perceived Organizational Support and Perceived Insider Status

A high level of perceived organization will enhance PIS. According to cognitive-emotional systems theory, an individual's cognitive unit affects the affective unit (Yuan, Xiao, & Li, 2020), which means that POS because of an individual's perception of the organization can impact the affective state of PIS. A higher POS helps one categorize oneself as part of the organization's membership (He & Brown, 2013). The caring, recognition, and respect encompassed by POS satisfy employees' socioemotional needs and facilitate their active integration into organizational membership (Zagenczyk, Gibney, Few, & Scott, 2011). The degree and type of organizational support received by employees are closely related to their position in the organization, and they can also perceive the degree of their importance within the organization through the process of interaction with their supervisors or colleagues. This perception affects employees' PIS (Liu, Deng, Liao, & Long, 2015). Secondly, employees'

POS stimulates the generation of PIS, and when employees receive organizational attention and importance, which indicates they are respected by the organization and are given a higher status and position within the organization, they are more likely to actively contribute to the organization and exhibit organizational citizenship behaviors (Guerrero, Sylvestre, & Muresanu, 2013; Xu, Zhao, Wei, & Shen, 2017).

HBT sends a signal to employees that their value is recognized by the organization, and the POS of employees can enable them to take organizational development as their work goal, think about improving workflow process, and solve work problems (Fang, 2019). That is to say that when an employee perceives organizational support by HBT, the employee feels a signal that they are important to the organization, which further increases the employee's intrinsic motivation and perceived internal status (Amabile, Schatzel, Moneta, & Kramer, 2004). Employees perceive themselves as part of the internal organization, assume organizational citizenship responsibilities, and develop emotions such as a sense of belonging to the organization, which will motivate employees to continuously think and find new ways and ideas that will facilitate both positive organizational change and personal performance improvement (Liu et al., 2015). Based on this, and combining H2 and H3, we propose:

Hypothesis 4 (H4): POS and PIS play a chain mediating role between HBT and EIB.

The Moderating Role of Family Supportive Supervisor Behavior

While having positive effects, HBT creates blurred boundaries between work and family and may bring work-family conflicts to employees (Leslie, Manchester, Park, & Mehng, 2012). On the one hand, HBT makes employees ready to work all the time, and work encroaching on the life domain and interfering with private time can increase role stress; on the other hand, issues at home can distract from work concentration and efficiency (Liu, 2020). FSSB provides specific resources for effective work-family balance for employees (Ma, Bao, & Wan, 2018). Organizational family support helps employees achieve harmonious work-family relationships and enhances positive spillover between work and family. At the same time, it may help employees better complete role transitions, avoid resource depletion between work and family roles, and buffer conflicts between roles (Fu, L. X. Zhang, & Y. Y. Zhang, 2020). FSSB effectively alleviates the dual stressors employees face from work and life, thus increasing employees' positive perceptions of their supervisors and organizations (Russo, Buonocore, Carmeli, & Guo, 2018). Supervisors exhibiting family supportive behavior help employees realize that supervisors care about their family life and can provide support, enhancing employees perceived meaningful work contribution (Zhang & Tu, 2018).

FSSB is also thought to moderate the chain mediating effect of POS and PIS between HBT and EIB. Supervisors providing family supportive behavior motivate employees to make better use of telework and gain a higher sense of control over their work, experience more organizational support, and see themselves as part of improving organizational performance, thus motivating innovative behavior (Aryee, Chu, Kim, & Rye, 2013; Ma et al., 2016). Therefore, the higher the FSSB, the stronger the effect of HBT on POS, and the stronger the chain mediating effect of POS and PIS between HBT and EIB. Based on this, we propose:

Hypothesis 5a (H5a): FSSB positively moderates the relationship between HBT and POS.

Hypothesis 5b (H5b): FSSB positively moderates the chain mediating effect.

The Three-Order Moderating Effect of Gender

Gender role theory suggests that traditional social cultures have different behavioral expectations for each gender, and different individuals usually keep their behaviors consistent with the role expectations to gain social

acceptance and avoid rejection by others (Li, Yao, Zhang, & Zhu, 2017). In the traditional Chinese culture, the concept of “the man goes out to work while the woman looks after the house” expects men to do well in social affairs while it expects women to do well in family affairs. If women are lacking in fulfilling their family responsibilities and men are not able to play their work roles well or are overly involved in family life, they will be misunderstood or resisted by others (Yuan, Wang, & Zhang, 2019).

When FSSB is higher, men can play their family roles more successfully and balance the work-family relationship because supervisors provide family support to help male employees put more time and energy into family matters. For most female employees, regardless of the high or low level of FSSB, they not only have to fulfill their work responsibilities, but also still have more household responsibilities. HBT can help female employees fulfill their family responsibilities well and generate POS, but the moderating effect of FSSB is not obvious. Therefore, relative to females, the effect of HBT on the POS among male employees varies to a greater extent at different levels of FSSB and the moderating effect of FSSB is more significant. Based on this, we propose:

Hypothesis 6 (H6): Gender moderates the moderating effect of FSSB on the relationship between HBT and POS.

Hypothesis 6a (H6a): Among male employees, FSSB positively moderates the relationship between HBT and POS.

Hypothesis 6b (H6b): Among female employees, the moderating effect of FSSB on the relationship between HBT and POS is not significant.

Methodology

Participants and Procedures

Data collection was from May through October 2021. We first screened 50 Internet and information technology companies from five major cities in northern, southern, western, eastern, and central China—Beijing, Shenzhen, Xi’an, Shanghai, and Wuhan—and conducted interviews with their human resources executives to learn about the implementation of HBT. Secondly, 20 companies were identified as within the scope of the study. We then sent an email to explain the purpose of the study to the HR executives and explained the details of the study at staff meetings, asking if they would participate. Twelve companies indicated their willingness to participate and provided contact details of their home-based teleworkers, consisting of technical, sales, legal staff, and some managers. Next, we sent emails with links to the questionnaires to those home-based teleworkers and followed up consistently with non-respondents via email over a five-week period. If they did not respond after five consecutive weeks, we contacted them by phone to invite them to participate in the survey.

We eventually received 282 responses. There were 48 excluded responses due to anomalous data patterns and an additional 21 excluded due to missing data; thus 213 responses were included in the data analysis. Among this valid sample, 54.5% were female and 45.5% were male; 73.2% of employees were aged 26-35; education level was concentrated in bachelor’s degree (75.6%), master’s degree and above (8%); and 27.7% of employees had worked for 3-5 years at their company while 49.8% of employees had worked for 6-10 years at their company.

Measures of Key Concepts

As explained below, the survey questions were derived from mature scales developed and utilized by prior scholars, and the contents of the scales were translated and semantically corrected from English to Chinese. The Chinese measurement items were finalized after review and pretested by relevant experts and employees. Each

questionnaire item used a six-point Likert response scale, ranging from one (strongly disagree) to six (strongly agree).

HBT: We used a revised scale developed by Rosen et al. (2013) with five questions, for example, “Considering my special situation, the company allows me to work from home”, “Considering my personal needs, the company allows me to do part of my work from home”, etc. The Cronbach’s alpha was 0.85.

EIB: We used the scale developed by Scott and Bruce (1994) with six questions, including “I actively seek to apply new methods, procedures, or technologies in my work”, “I often generate creative ideas and innovative thoughts”, etc. The Cronbach’s alpha was 0.71.

POS: We used the scale developed by Ling, Yang, and Fang (2006) with six questions, including “The company listens and considers my ideas”, “The company cares about my interests and well-being”, etc. This scale is applicable to the Chinese context and has been validated in previous studies. The Cronbach’s alpha was 0.73.

PIS: We used the scale developed by Stamper and Masterson (2002) with five questions, including “I feel strongly that I am a part of the company”, “I don’t feel like I belong to the company”, etc. The Cronbach’s alpha was 0.70.

FSSB: We drew upon the scale developed by Hammer, Kossek, and Yragui (2009) by using four items, including “My supervisor works effectively with employees to creatively solve problems between work and family”, “My supervisor demonstrates effective behaviors in how he or she deals with work and family issues”, etc. The Cronbach’s alpha was 0.72.

Control variables: Previous studies have identified socio-demographic characteristics including age, education level, and organizational tenure as factors associated with the above variables (Nakrošienė et al., 2019). We used these three as control variables and also measured and considered gender.

Data Analysis and Results

Confirmatory Factor Analysis

Confirmatory factor analysis was conducted using AMOS 24.0 on five variables: HBT, POS, PIS, EIB, and FSSB. As shown in Table 1, the five-factor model had the best fit, indicating good discriminant validity.

Table 1

Confirmatory Factor Analysis Results

Factor model	χ^2/df	CCFI	RRMSEA	RMR	IFI	TLI
Five factors: HBT, POS, PIS, EIB, FSSB	1.490	0.917	0.048	0.029	0.920	0.902
Four factors: HBT, POS + PIS, EIB, FSSB	1.640	0.891	0.055	0.030	0.894	0.872
Three factors: HBT, POS + PIS + EIB, FSSB	1.794	0.863	0.061	0.032	0.867	0.841
Double factor: HBT + FSSB, POS + PIS + EIB	1.995	0.827	0.068	0.036	0.832	0.801
Single factor: HBT + POS + PIS + EIB + FSSB	2.552	0.729	0.086	0.041	0.736	0.689
Five factors + method factor	1.334	0.947	0.040	0.023	0.949	0.931

Common Method Biases Analysis

Harman single factor test and the unmeasurable potential method factor effect control method were used to test for common method bias. Principal component analysis of all question items yielded eight factors with eigenvalues greater than one, and the value of factor explained variance for the largest eigenvalue was 25.995%, which was less than 30%. The common method factor was added to the model as a new latent variable, and all measured question items were allowed to have loadings on this method factor. Table 1 shows that after controlling for the method factor, $\Delta CFI = 0.03$, $\Delta RRMSEA = 0.008$, $\Delta RMR = 0.006$, $\Delta IFI = 0.029$, $\Delta TLI = 0.029$, the fit

metrics were not significantly improved over the five-factor model. Therefore, there was no common method bias of concern in the sample data.

Descriptive Statistics and Correlations

The means, standard deviations, and correlation coefficients are shown in Table 2. HBT was positively correlated with EIB ($\gamma = 0.304$, $p < 0.01$), POS ($\gamma = 0.419$, $p < 0.01$), and PIS ($\gamma = 0.341$, $p < 0.01$). POS was positively correlated with EIB ($\gamma = 0.498$, $p < 0.01$) and PIS ($\gamma = 0.349$, $p < 0.01$). PIS was positively correlated with EIB ($\gamma = 0.427$, $p < 0.01$). These results laid the foundation for the subsequent hypothesis testing.

Table 2

Descriptive Statistics and Correlations Among Study Variables

Variables	M	SD	1	2	3	4	5	6	7	8
1. Gender	1.46	0.499								
2. Age	2.09	0.588	-0.010							
3. Education	2.87	0.608	0.074	-0.152*						
4. Organizational tenure	2.73	0.853	0.049	0.726**	-0.051					
5. HBT	4.14	0.674	0.072	0.103	-0.065	0.327**				
6. POS	4.28	0.420	0.010	0.066	0.069	0.328**	0.419**			
7. PIS	4.51	0.388	0.122	-0.017	0.048	0.171*	0.341**	0.349**		
8. EIB	4.37	0.410	0.113	0.056	0.078	0.240**	0.304**	0.498**	0.427**	
9. FSSB	4.28	0.550	-0.018	0.068	0.037	0.214**	0.590**	0.576**	0.375**	0.354**

Notes. * $p < 0.05$, ** $p < 0.01$.

Hypothesis Testing

Main effect testing. Our study used regression analysis to test the main effect of HBT on EIB as shown in Table 3, and after putting control variables into the model there was a significant positive effect of HBT on EIB in Model 6 ($\beta = 0.232$, $p < 0.01$), and H1 held.

Table 3

Results of Regression Analysis

Variables	POS			PIS			EIB		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Age	-0.256**	-0.139	-0.137	-0.205*	-0.191	-0.164	-0.057	-0.094	-0.016
Education	0.072	0.051	0.042	0.047	0.010	0.083	0.052	0.066	0.044
Organizational tenure	0.414**	0.258**	0.236**	0.227*	0.216*	0.287**	0.114	0.210*	0.076
HBT	0.315**	0.186*	0.238**	0.291**		0.232**	0.100	0.132	0.039
POS					0.291**		0.420**		0.360**
PIS								0.341**	0.273**
FSSB		0.751**	0.682**						
Gender		-0.029	-0.092						
HBT \times FSSB		0.425**	0.323**						
HBT \times Gender		0.164*	0.204**						
FSSB \times Gender		-0.248**	-0.089						
HBT \times FSSB \times Gender			0.277**						
R^2	0.256	0.510	0.532	0.144	0.142	0.137	0.268	0.236	0.329
ΔR^2	0.241	0.099	0.022	0.128	0.126	0.046	0.250	0.218	0.309

Notes. * $p < 0.05$, ** $p < 0.01$.

The mediating effect testing. As shown in Table 3, the positive relationship between HBT on POS in Model 1 was significant ($\beta = 0.315, p < 0.01$). After including POS in the mediation model, the positive relationship between POS on EIB in Model 7 was significant ($\beta = 0.420, p < 0.01$) and the positive relationship between HBT on EIB was not significant ($\beta = 0.100, p > 0.05$), indicating that POS played a fully mediating role between HBT and EIB, and H2 held. Similarly, the positive correlation between HBT on PIS in Model 4 was significant ($\beta = 0.291, p < 0.01$), and after including PIS in the mediation model in Model 8, the positive correlation between PIS on EIB was significant ($\beta = 0.341, p < 0.01$), and the positive correlation between HBT on EIB was not significant ($\beta = 0.132, p > 0.05$), indicating that PIS played a fully mediating role between HBT and EIB, and H3 held. After including POS and PIS in the chain mediation model, the positive relationship between HBT and EIB in Model 9 was not significant ($\beta = 0.039, p > 0.05$), indicating that the POS and PIS played a fully chain mediating role, and H4 held.

The moderating effect testing. *The moderating effect of FSSB.* To test the moderating effect of FSSB, the data on the independent and moderating variables were first standardized to eliminate covariance. As shown in Table 3, the interaction term between HBT and FSSB in Model 2 had a significant positive effect on POS ($\beta = 0.425, p < 0.01$), indicating that FSSB positively moderated the effect of HBT on POS. As depicted in Figure 2, the effect of HBT on EIB was stronger at high levels of FSSB compared to low levels of FSSB for combined genders, and H5a held.

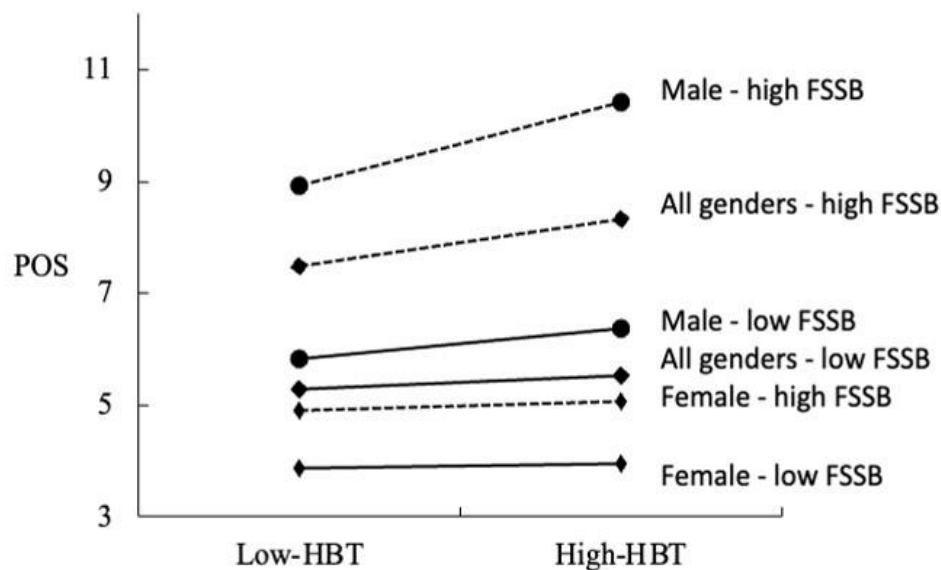


Figure 2. Moderating effect of FSSB on POS by gender.

Moderating the chain mediating effect. In this study, Model 83 in Process was used to add each variable to the model to test the moderating effect of the chain mediating. The sample was divided into two groups according to the magnitude of FSSB, with data one standard deviation above the mean of FSSB as the first group and data one standard deviation below the mean of FSSB as the second group, and the mediating effect was estimated for each group. The results showed that when FSSB was high, the mediating effect value of HBT through POS and PIS on EIB was 0.0100, with 95% confidence interval of [0.0003, 0.0295], and the chain mediating effect was significant; when FSSB was low, the value of the mediating was -0.0020, with 95% confidence interval of [-0.0118, 0.0079], including 0, and the chain mediating effect was not significant. Therefore, the chain mediating

effect of POS and PIS between HBT and EIB was stronger when FSSB was high compared to when FSSB was low, and H5b held.

The three-order moderating effect. As shown in Table 3, the three-order interaction term for HBT, FSSB, and gender was significant ($\beta = 0.277$, $p < 0.01$), which demonstrated the presence of three-order moderation (Luo & Jiang, 2014), and H6 held. Also, the moderating effect of FSSB on HBT and POS was further tested separately for the male and female groups. As shown in Table 4, Model 13 had a significant interaction term between HBT and FSSB in the male group ($\beta = 0.715$, $p < 0.01$), which indicated that FSSB positively moderated the relationship between HBT and POS, and H6a held. While in Model 17, the interaction term was not significant ($\beta = 0.077$, $p > 0.05$), indicating that FSSB failed to moderate the relationship between HBT and organizational support, and H6b held. Figure 2 also portrays the moderating effect of FSSB by gender and helps visualize the differential impact among the genders.

Table 4

The Moderating Effect of FSSB in the Gender Sample

Variables	Perceived organizational support							
	Male				Female			
	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
Age	-0.448**	-0.380**	-0.400**	-0.200	-0.280*	-0.162	-0.092	-0.079
Education	-0.021	0.020	0.003	0.049	0.104	0.113	0.040	0.046
Organizational tenure	0.646**	0.530**	0.534**	0.237	0.559**	0.332*	0.249**	0.239*
HBT		0.269**	0.073	0.406**		0.367**	0.044	0.044
FSSB			0.267*	0.605**			0.697**	0.757**
HBT × FSSB				0.715**				0.077
R^2	0.179	0.244	0.277	0.426	0.177	0.283	0.641	0.644
ΔR^2	0.179	0.065	0.033	0.149	0.177	0.106	0.358	0.002

Notes. * $p < 0.05$, ** $p < 0.01$.

Robustness Testing

The mediating effect. In addition, our study used Process macro to more accurately test for the mediating effect. Bootstrapping repeated sampling 5,000 times to construct 95% unbiased corrected confidence intervals. Firstly, Model 4 in Process was used to test the separate mediating effects of POS and PIS between HBT and EIB, respectively. The results showed that POS played a fully mediated role between HBT and EIB, with the mediation coefficient 0.0804, 95% confidence interval [0.0309, 0.1527], excluding 0. H2 was further supported. Similarly, PIS played a fully mediating role between HBT and EIB, with the mediation coefficient 0.0604, 95% confidence interval [0.0158, 0.1385], excluding 0. H3 was further supported.

Then, in the relationship model between HBT and EIB, POS and PIS were introduced simultaneously, thus constructing a chain mediation model between HBT and EIB, as shown in Table 5. The chain mediation effect of both was tested using Model 6 in Process. Total effect of HBT on EIB was 0.1409 with a 95% confidence interval of [0.0571, 0.2248], not containing 0. H1 was further supported. Direct effect was 0.0237 with a 95% confidence interval of [-0.0565, 0.1039], containing 0. Total mediating effect was 0.1172 with a 95% confidence interval of [0.0557, 0.2101], not containing 0, indicating significant total mediating effect. Mediation effect 1: HBT → POS → EIB was 0.0689 with a 95% confidence interval of [0.0256, 0.1291], a significant mediation effect with an effect size of 58.79%. Mediation effect 2: HBT → PIS → EIB was 0.0369 with a 95% confidence

interval of [0.0089, 0.0870], a significant mediation effect and an effect size of 31.48%. Mediation effect 3: The mediation effect of HBT → POS → PIS → EIB was 0.0114 with a 95% confidence interval of [0.0011, 0.0322], and the chain mediation effect was significant with an effect size of 9.73%. Among the paths that had an effect through POS, in addition to one that directly affected EIB, there was another one that affected EIB by affecting PIS, the chain mediation effect and was fully mediated, and H4 was further supported.

Table 5

Tests of the Mediating Effect of POS and PIS

Path	Effect	SE	Bootstrapping 95%		Effect percent
			LLCI	ULCI	
Total effect	0.1409	0.0425	0.0571	0.2248	
Direct effect	0.0237	0.0407	-0.0565	0.1039	
Total mediating effect: Ind1 + Ind2 + Ind3	0.1172	0.0400	0.0557	0.2101	
Ind1: HBT → POS → EIB	0.0689	0.0270	0.0256	0.1291	58.79%
Ind2: HBT → LIP → EIB	0.0369	0.0202	0.0089	0.0870	31.48%
Ind3: HBT → POS → PIS → EIB	0.0114	0.0081	0.0011	0.0322	9.73%
Contrasting mediating effects	Ind1-Ind3	0.0575	0.0251	0.0172	0.1129
	Ind2-Ind3	0.0254	0.0173	0.0007	0.0675

The moderating effect. In the male group, at low levels of FSSB the coefficient of HBT on POS was 0.1351 with 95% confidence interval of [-0.0094, 0.2797], containing 0, which was not significant, while at high levels of FSSB the coefficient of HBT on POS was 0.4436 with 95% confidence interval of [0.2556, 0.6315], not containing 0. This suggested that FSSB positively moderated the relationship between HBT and EIB, and H6a was further supported. However, in the female group, at low levels of FSSB the coefficient of HBT on POS was 0.008 with 95% confidence interval of [-0.1069, 0.1229], containing 0, which was not significant, while at high levels of FSSB the coefficient of HBT on POS was 0.0518 with 95% confidence interval of [-0.0613, 0.1650], containing 0, indicating that FSSB failed to moderate the relationship between HBT and EIB, and H6b was further supported.

Table 6

The Three-Order Moderating Effect of Gender

Variables	Effect	SE	Bootstrapping 95%		
			LLCI	ULCI	
Female	Low level FSSB	0.0080	0.0583	-0.1069	0.1229
	Medium level FSSB	0.0299	0.0461	-0.0609	0.1208
	High level FSSB	0.0518	0.0574	-0.0613	0.1650
Male	Low level FSSB	0.1351	0.0733	-0.0094	0.2797
	Medium level FSSB	0.2894	0.0810	0.1296	0.4491
	High level FSSB	0.4436	0.0953	0.2556	0.6315

Discussion

Theoretical Contributions

As a newer practice in human resource management, there is a lack of prior research on whether HBT triggers positive employee behaviors. Although there is a large body of research on EIB in the organizational behavior literature, few studies have focused on EIB from the work setting perspective. Our study verified the

positive effects of HBT on EIB, revealed the mediating mechanisms between HBT and EIB, and examined the boundary conditions involved.

Firstly, we confirmed that HBT can positively affect EIB, a finding that is largely consistent with previous scholarly findings. HBT reduces employees' commuting time and non-work-related commitments and increases productivity (Akbari & Hopkins, 2019; Hopkins & McKay, 2019). This is because working remotely from home allows employees to avoid the distractions of their colleagues and the work environment may remain relatively quiet. The opportunities provided to employees to focus on work tasks can increase the level of job performance (Nakrošienė et al., 2019; Vega, Anderson, & Kaplan, 2015). Our study clarified the impact of HBT on EIB in multiple paths from the perspective of work arrangement, which provided new ideas for stimulating EIB.

Secondly, our study verified the mediating role of POS between HBT and EIB, and found that POS directly affects PIS when PIS is included, suggesting that POS provides a basis for employees to perceive their identity status in the organization (Xu et al., 2017). When employees are treated well in the organization, they categorize themselves as "insiders" relative to the organization rather than "outsiders". At the same time, POS can further influence EIB through PIS, and the effect of POS is stronger than PIS. POS plays a more critical role in stimulating EIB. The finding that POS positively influences EIB through PIS explains the critical path role of organizational environment and psychological perception mechanisms on employee innovation (Liu et al., 2015).

Our study introduced individual psychological perceptions in the research model and revealed the parallel as well as continuous mediated course of POS and PIS. POS characterizes the cognitive process of employees toward the organization and PIS reflects the emotional mechanism of employees in the work environment, which ultimately stimulates innovative behavior in line with the transmission path of the cognitive-emotional system theory (Yuan et al., 2020).

Finally, while HBT has positive effects, it may also expose employees to the negative effects of social isolation and reduced colleague interaction (Jackson & Fransman, 2018). Employees' work needs to be done in a special home environment, employees face difficulties in separating their home time from their work time, and the boundaries between work and family may become blurred as employees are prone to overwork (Felstead & Henseke, 2017; Vayre, 2019). Moreover, for women, HBT can have a negative impact on work-family balance (Kurowska, 2020). Therefore, our study introduced FSSB as a boundary condition from a supply perspective and verified the three-order moderating effect of gender. We identified multiple moderating effects of FSSB and gender in the relationship between HBT and POS, with FSSB and different role behavior expectations jointly influencing the role of HBT. High levels of FSSB are a key factor in achieving work-family balance and can improve work-family balance relationships, which in turn affects organizational and individual work outcomes (Zhang et al., 2018; Idrovo & Bosch, 2019; Rofcanin, Las Heras, Escribano, & Stanko, 2020).

Practical Significance

Our study has implications for management practice. Firstly, companies should get a handle on the scope and scale of their HBT implementation. Managers should recognize that not all employees are subject to standardized employment agreements. As a personalized and differentiated work arrangement, HBT is currently a reference for companies to attract and retain some high-value employees, and some personalized employment methods such as HBT can meet the differentiated work needs of high-value employees and provide them with higher job autonomy. In particular, the high-risk nature of innovation exposes employees to a variety of pressures from within the organization. The flexibility of HBT cushions some of these pressures by freeing employees from

traditional office-related work issues that are unrelated to their jobs and allowing them to focus more on their own innovative ideas. However, not all employees are suitable for telework (and possibly not all companies or industries), and the implementation of HBT should not ignore its possible negative effects. While HBT gives employees autonomy, it can also create problems such as blurred work-family roles.

Secondly, managers should regularly pay attention to the psycho-emotional changes of employees to improve their POS and PIS. Our study confirmed that POS plays a critical role in stimulating EIB. Therefore, it is important for managers to improve support policies such as fair promotion opportunities, improved welfare, innovation support, and a positive atmosphere toward making errors. In addition, they can provide employees with display platforms and opportunities to improve their innovation self-confidence and willingness to challenge intractable problems by providing relevant supporting measures to improve EIB. In China's collectivist culture, employees who perceive themselves as "insiders" have a high sense of loyalty and responsibility and will usually act positively with a sense of obligation to the coworkers and the organization. Therefore, managers should respect the value of employees, recognize their contributions to the company, care for their own interests and well-being, and provide relevant and supportive resources in the work and family areas, so that employees feel part of the organization, integrate their personal goals with corporate goals, and seek innovation.

Finally, managers should encourage FSSB and provide more caring resources particularly to female employees. Based on the above discussion, FSSB plays an important boundary role with HBT. With the use of HBT and the increasing number of dual-earner families, the requirements for supervisors in this context are also increasing. Organizations should consider focusing on family supportive styles when recruiting and selecting supervisors, increase supervisor training on emotional and instrumental resource support, encourage innovative work-family management skills, and increase relevant indicators in assessing the FSSB of supervisors. For male employees, FSSB positively moderates the relationship between HBT and perception of organizational support, while for women, the moderating effect is not significant. On the one hand, this shows that women bear the dual responsibilities of work and family in real life, so the organization should consider providing more caring policies to improve POS for female employees. On the other hand, the organization could encourage male employees, especially in dual earner families, to actively assume more family responsibilities, and could use additional supports to help these male employees balance the work-family relationship.

Limitations and Directions for Future Research

This study contributes to the existing literature, but there are limitations. First is the study population. In the sampling process, we chose five major Chinese cities and focused on Internet and information technology companies. Different regions and cities have different dynamics in ways that can and cannot be measured, and different industries have diverse skill sets and even regulatory environments. These factors are relevant to the generalizability of this study, and so a larger multi-industry study would be useful in the future.

Secondly, the data were self-reported by employees. Although the common method bias test was within acceptable limits and responses with anomalous data patterns or missing data were excluded, this still inevitably had an impact on the results. A combination of self-assessments and other assessments, as well as a longitudinal study, could be used in the future to further reduce common method bias and the perceptual nature of the data.

Finally, the theoretical mechanisms of HBT need to be further investigated, and future research could integrate the organizational and individual levels to investigate the tangible management practices of HBT. Additionally, the complexity of employee and organizational innovation are robust, and our study relied on the

perspectives of resource conservation theory, social exchange theory, and cognitive-emotional system theory to explore the relationship between HBT and EIB. Other conceptual frames may be relevant.

Conclusion

The sudden onset of the COVID-19 pandemic forced many companies to change their work practices, and HBT quickly became the new norm for work in an epidemic-isolated environment. We constructed a chain mediation model of HBT triggering EIB, taking POS and PIS as mediate variables, relying on resource conservation theory, social exchange theory, and cognitive-emotional systems theory. FSSB and gender were included as boundary conditions of the impact of HBT on POS, constructing a third-order regulation model. Our data were self-reported by 213 home-based teleworkers in 12 Internet and information technology companies in China, and found that (1) HBT positively influences EIB; (2) POS and PIS mediate the relationship between HBT and EIB separately, and the mediating role of POS is stronger than that of PIS; (3) POS and PIS also play a chain mediating role; (4) FSSB positively moderates the effect of HBT on POS; and (5) gender moderates the moderating effect of FSSB on HBT and POS.

Key takeaways are that HBT can serve the organization well and likely enhances innovation by promoting innovative behaviors, and that the organization can increase this outcome through actions that increase the employee sense of belonging. In addition, and not surprisingly, FSSB is more valuable to assist female HBT workers because the traditional home dynamic assumes they will continue to be dominant with household and childrearing even when also working full time.

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