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The dual effects of job design on knowledge hiding: expanding job demands–resources theory to employee rational-choice behaviour

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ABSTRACT

Human resource management (HRM) literature often uses motivational theories to examine how job design motivates employees to manage newly established employee behaviours such as knowledge-hiding. However, the literature finds that whereas job-design characteristics reduce knowledge hiding, others unexpectedly encourage it. By integrating the cost-benefit analysis framework into the job demands–resources (JD–R) theory, we examine how job demands and job resources as two distinct types of job-design characteristics influence the expected costs and benefits of sharing solicited knowledge to affect knowledge hiding differently. In summary, we find that job demands encourage knowledge hiding, whereas job resources lower it. We contribute that job-design characteristics act as job demands or resources to affect knowledge hiding differently. Further, we explain the unexpected findings concerning why and how job-design characteristics – as job demands – encourage knowledge hiding by stimulating the expected costs but do not motivate employees to produce the expected benefits. In addition, by integrating the cost-benefit analysis framework into the JD–R theory, we contribute that job demands and resources affect the cost-benefit analyses, influencing employees' rational choice behaviour. This integration considerably expands the JD–R theory's application scope from employee well-being and performance to rational choice behaviours.

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1. Introduction

HRM literature reveals a trend of using motivational theories to examine how job design motivates employees to help manage newly emerging employee work behaviours or outcomes (Knight & Parker, 2021) such as performance (Hackman & Oldham, 1975), knowledge sharing (Foss et al., 2009) and knowledge hiding (Gagné et al., 2019). These theories include the job characteristics theory (Hackman & Oldham, 1975) and the self-determination theory (Ryan & Deci, 2000). Job design, namely, the content and organisation of an employee's tasks, relationships and responsibilities (Morgeson & Humphrey, 2006), is a seminal, inexpensive and the most-researched, albeit complex HRM practice for managing employees (Foss et al., 2009). We study knowledge hiding after having observed it recently emerge as a trend in the literature and because it damages the performance of the individuals involved (Xiao, 2024). Although failing to share knowledge can be due to not possessing knowledge, knowledge hiding refers to when an employee deliberately conceals the knowledge they hold that another colleague has sought (Connelly et al., 2012; Škerlavaj et al., 2023). The hiding of knowledge is a rationally chosen behaviour based on an employee's analysis of what they may expect by way of costs and benefits. In sum, knowledge-hiding literature draws on self-determination theory to examine how job design encourages employees (Gagné et al., 2019) to realise the non-financial benefits expected by sharing the solicited knowledge[1] and to decrease the expected financial benefits (Zhang & Min, 2021) that, in turn, reduce knowledge hiding (see meta-analyses for details (Arain et al., 2024; Shen et al., 2025; Škerlavaj et al., 2023; Xiao, 2024).

However, while the literature finds that job-design characteristics (e.g. job autonomy) lower knowledge hiding, others, like initiated interdependence and job complexity, unexpectedly encourage it (Gagné et al., 2019; Zhang & Min, 2021). Still, integrating the cost-benefit analysis framework (Blau, 1964) into the job demands–resources (JD–R) theory (Demerouti et al., 2001) suggests that job demands and resources are two distinct types of job-design characteristics (Bakker & Demerouti, 2024) that affect both the employee's expected costs and benefits in varying ways (Cham et al., 2021), which, in turn, affect knowledge hiding differently (Xiao, 2024). Accordingly, the integration offers two critical nuances of the job demands and resources and the expected cost mechanism, regarding which the HRM literature on the motivating role of job design for the rational choice behaviour of knowledge hiding is lacking to explain the unexpected findings (Gagné et al., 2019). *via* a cost-benefit analysis framework, the literature explores the extent to which, as rational beings, employees conceal their knowledge when they expect both minimal benefits and high costs of sharing the solicited knowledge

(Xiong et al., 2021). Parallel to this, since its inception, the JD–R theory has primarily studied how job demands and resources affect employee health impairment and motivation to affect employee well-being and performance differently (Bakker & Demerouti, 2024; Demerouti et al., 2001). However, the theory has now shifted to integrating explanations from other theories and expanding its application beyond its typical scope of well-being and performance outcomes (Demerouti & Bakker, 2023). Hence, integrating the cost-benefit analysis framework into the JD–R theory would also advance knowledge concerning how job demands and resources impact the expected cost and benefits to influence rational choice behaviours (Cham et al., 2021). This integration would significantly expand the typical scope of the JD–R theory to cover rational-choice behaviours.

Our study examines how job demands and resources affect knowledge hiding differently by affecting the expected costs and benefits of solicited knowledge sharing in distinct ways (Figure 1). Our research is timely because current HRM research is increasingly focused on unearthing, establishing and managing employees' rational choices and counterproductive behaviours on various levels through job (re)design, perhaps more than ever (Knight & Parker, 2021), with examples including knowledge sabotage (Serenko, 2019), unit-level counterproductive behaviours (Carpenter et al., 2021), quiet quitting (Anand et al., 2024) and resenteeism (Hungerford et al., 2024). Moreover, research on the unintended side effects of job (re)design on employees is fragmented but emerging (Fasbender & Gerpott, 2023; Johns, 2010). We suggest that HRM research should employ the JD–R theory instead of exclusively motivational theories to study the role of job design in managing a variety of newly
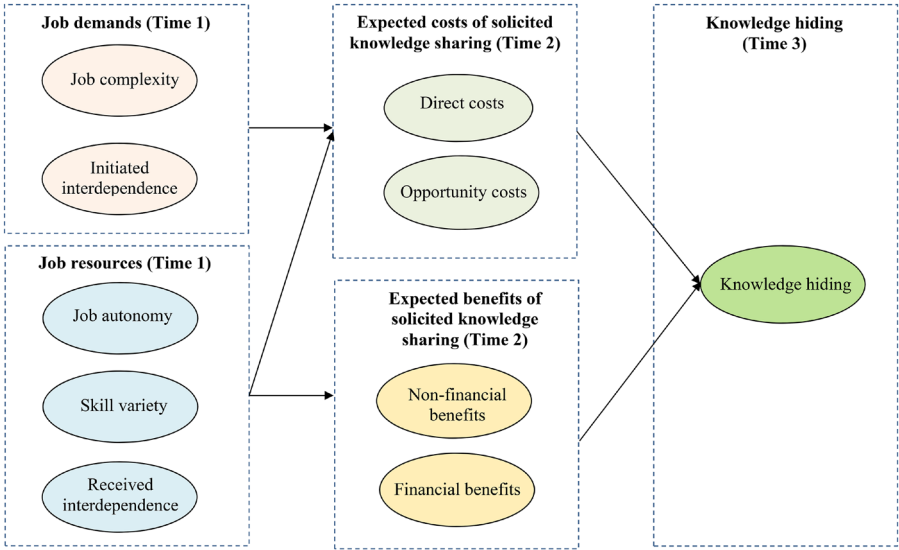

Figure 1. Research model.

established employee behaviours (e.g. rational choice, (counter)productive, and well-being outcomes). As an overarching theory, JD–R theory has subsumed explanations coming from different theories (e.g. motivational theories) to provide a more nuanced view of the various effects of the types of job-design characteristics *via* various mechanisms (costs and motivation (expected benefits) on various employee outcomes. We propose that motivational theories be used when there are sufficient grounds for only the motivating effect of given job-design characteristics for managing employee outcomes (Knight & Parker, 2021). We suggest that HR practitioners design and facilitate employees to (re)craft their jobs with low demands and greater resources to reduce knowledge hiding.

We consider three-wave, time-lagged surveys to collect data from 332 knowledge workers in Pakistani knowledge-intensive industries. Their relevant and unique work context typically involves prolonged exposure to job demands and low access to job resources to produce a knowledge-hiding climate and impede actors' performance (Arain et al., 2024). We provide three main theoretical contributions. First, we contribute to the knowledge-hiding literature (Gagné et al., 2019) by showing that job demands and resources are two types of job-design characteristics that affect the expected costs and benefits to influence knowledge hiding differently. Job demands encourage knowledge hiding, whereas job resources reduce it. Second, we explain the unexpected findings in the motivational theories of job design (Foss et al., 2009; Gagné et al., 2019) regarding why and how certain job-design characteristics stimulate employee outcomes such as knowledge hiding. We explain that although job-design characteristics which act as job demands encourage knowledge hiding by affecting the expected costs, they do not motivate employees to produce an effect on the expected benefits. Third, we contribute to the JD–R theory by incorporating the mediating role of expected costs and benefits between the job demands and resources and the employee's rational choice and (counter)productive behaviour (Bakker & Demerouti, 2024). Accordingly, we indicate that prolonged exposure to job demands and little access to job resources distinctively affect the health costs and motivations, which, in turn, prompt employees, as rational beings, to conduct the expected cost-benefit analysis and subsequently demonstrate rational-choice and counterproductive behaviours such as knowledge hiding.

2. Hypotheses development

2.1. JD–R theory and knowledge-hiding literature

JD–R theory looks at how prolonged exposure to job demands brings costs to employees' health, jeopardising their well-being and performance (Bakker & Demerouti, 2024). Job resources lower these costs

and motivate employees to participate in professional development activities to shape their well-being (decreased burnout and increased work engagement) and performance, respectively. The knowledge-hiding literature lacks any comprehensive deployment of the JD–R theory to study the impact of various job-design characteristics (Morgeson & Humphrey, 2006) as job demands and resources on knowledge hiding (see (Škerlavaj et al., 2023; Zhang & Min, 2022; Zhang et al., 2022). For instance, Zhang and Min (2022) apply the JD–R theory to investigate the impact of a supervisor's knowledge hiding on subordinates' turnover intentions.

We investigate the role of two job demands (job complexity and initiated interdependence) and three job resources (job autonomy, skill variety, and received interdependence) that are recognised in the JD–R theory (Bakker, 2015; Wilkinson et al., 2023). Morgeson and Humphrey (2006) define them as follows. *Job complexity* is the degree to which job tasks are complicated. *Initiated interdependence* represents how work activities flow from one job to another. *Job autonomy* is the degree to which a job allows discretion in scheduling work activities, choosing work methods, and making decisions. *Skill variety* refers to the degree to which job performance requires various skills. *Received interdependence* represents how work activities flow from other jobs to a given job.

We chose these job demands and resources for the following reasons. First, they have been examined in previous HRM literature on the motivating role of job design for reducing knowledge hiding (Gagné et al., 2019; Zhang & Min, 2021). Thus, their selection would permit us to compare our findings—based on the two critical nuances of the job demands and resources distinction and the expected cost mechanism—with the unexpected findings of the HRM literature in the motivational theories concerning why some job-design characteristics encourage knowledge hiding. Second, they are comprehensive enough to capture all dimensions of job design, including the task (job autonomy), knowledge (job complexity and skill variety) and social dimensions (initiated and received interdependence) (Morgeson & Humphrey, 2006).

2.2. Integration of the cost-benefit analysis framework into the JD–R theory

The cost-benefit analysis framework within the social exchange theory explains that employees rationally choose behaviour in social contexts or interactions with each other (Blau, 1964; Emerson, 1976). This suggests that as rational beings, employees rationally decide to hide their knowledge in social interactions when they expect minimal benefits and high costs from sharing the knowledge that is solicited (Xiong et al., 2021).

Expected costs and benefits are the antithesis of each other (Kankanhalli et al., 2005). Thus, expected costs are valued work aspects (e.g. time) that employees expect to lose while sharing sought-after knowledge (Xiong et al., 2021). On the other hand, expected benefits are valued work outcomes that employees expect to gain by sharing such knowledge (Xiong et al., 2021). Knowledge-hiding literature also reports findings supporting the cost-benefit analysis framework in the conservation of resources theory (Hobfoll, 1989); for instance, the expected cost of losing time by sharing the solicited knowledge and losing an opportunity to use that time for other valued available alternatives (e.g. spending time with family and at work) encourages knowledge hiding (He et al., 2024; Škerlavaj et al., 2018).

Even though the JD–R theory has integrated explanations from other theories (e.g. self-determination theory and conservation of resources theory) (Bakker & Demerouti, 2024), earlier attempts at integrating the social exchange theory into the JD–R theory did not integrate its cost-benefit analysis framework. JD–R theory literature previously focused on integrating the other aspects of the social exchange theory as mechanisms between the impact of job demands and resources on employee work outcomes (e.g. psychological contract (Birtch et al., 2016), perception of equity (Hu et al., 2013) and reciprocity to strengthen the employment relationships (Laurent et al., 2018). However, Cham et al. (2021) hint at how exhaustion caused by prolonged exposure to job demands prompts expected cost-benefit analyses that, in turn, lead employees to choose the most beneficial alternatives among the available ones. In conclusion, while the JD–R theory literature lacks any integration of the cost-benefit analysis framework, it hints that job demands and resources induce expected cost-benefit analyses, which subsequently affect their engagement in rational-choice behaviours (Cham et al., 2021).

Integrating the cost-benefit analysis framework into the JD–R theory (Cham et al., 2021) hence suggests that pursuing the demands of one's job exhausts employees' work time and energy, leading to the expected costs of solicited knowledge sharing to encourage knowledge hiding (Bakker & Demerouti, 2024). Yet, the low or high degree of job demands does not motivate employees to affect the expected benefits and influence knowledge hiding. Job resources lower knowledge hiding by decreasing these expected costs and satisfying innate human needs (Ryan & Deci, 2000) to motivate employees (Demerouti et al., 2001) and influence the expected financial and non-financial benefits (Zhang & Min, 2021). The cost-benefit analysis framework, in turn, suggests that the expected costs and benefits affect knowledge hiding in different ways (Kankanhalli et al., 2005; Xiong et al., 2021).

2.3. Job demands stimulate a weighing up of the expected costs to encourage knowledge hiding

Job demands are job-design characteristics, and continued exposure to them calls for sustained work energy and time (Demerouti et al., 2001). Thus, job demands are associated with physiological and psychological costs for one's health and well-being (Li et al., 2024). When employees exhausted from pursuing high job demands are solicited for knowledge, their exhaustion leads them to expect significant sharing costs. Literature indicates that, as rational beings, employees expect and evaluate two psychological costs—direct costs and opportunity costs (Sun et al., 2014)—to arise when they hide the solicited knowledge (Xiao, 2024). *Direct costs*, also called actual costs, are employees expecting the immediate loss of valuable work aspects (e.g. work time and mental effort) by sharing solicited knowledge (Sun et al., 2014). Direct cost, therefore, primarily captures the complexity of the solicited knowledge; thus, sharing it would take longer time and effort. As rational beings, employees inevitably consider and evaluate the alternatives at hand and pursue those they regard as the most important, making the *opportunity cost* relevant (Kankanhalli et al., 2005).

Also called alternative costs, *opportunity costs* refer to employees expecting the loss of valuable alternative activities and work outcomes should they choose to share the knowledge being asked for (Sun et al., 2014). These alternatives are essential for their interests or well-being and performance. Opportunity cost is not the same as direct cost (Sun et al., 2014). Opportunity cost represents the valued outcomes or benefits that can be gained by not investing the time and effort in sharing solicited knowledge (Kankanhalli et al., 2005; Sun et al., 2014). The literature (Xiao, 2024; Xiao & Cooke, 2019) empirically indicates that the opportunity costs include the expected loss of chances to: (i) do the job (Connelly et al., 2014); (ii) enjoy the social interactions with colleagues at work (Sun et al., 2014) or with family while working at home online (He et al., 2024); (iii) rest (Connelly et al., 2012); and (iv) hold psychological ownership of and the power that the solicited knowledge has provided (Kaur & Kang, 2023). Losing these valued aspects or interests compromises employee well-being and performance (Černe et al., 2017).

Integrating the cost-benefit analysis framework into the JD–R theory suggests that pursuing job demands for extended periods leads employees, as rational beings, to expect direct and opportunity costs to arise (Demerouti & Bakker, 2023), encouraging them to hide their knowledge (Škerlavaj et al., 2023). Complex jobs require employees to invest considerable time and effort in understanding and improvising complicated tasks (Bakker Arnold & Demerouti, 2007). Similarly, jobs with high initiated interdependence call for employees to invest considerable time and effort in preparing workflow

activities for the dependent jobs (Johns, 2010). Accordingly, pursuing job demands exhausts employee time and energy, in turn adding to time and energy pressure, power tension, and role conflicts (Kaur & Kang, 2023; Lesener et al., 2019). Employees in demanding jobs thus expect to incur substantial direct and opportunity costs (Connelly et al., 2014).

As rational beings (Blau, 1964), employees value their interests (alternative opportunities) over citizenship activities (Cham et al., 2021; Emerson, 1976). Employees are, therefore, inclined to conserve (Hobfoll, 1989) whatever is left in their work time and energy to pursue valued opportunities (Cham et al., 2021; He et al., 2024; Škerlavaj et al., 2018). Sharing solicited knowledge is typically an employee's voluntary act of good organisational citizenship rather than a core job responsibility (Černe et al., 2017). Solicited knowledge sharing can further deplete employees' work time and energy, which are already squeezed due to needing to complete job demands (Jneid, 2023), leaving little or nothing for valued alternative opportunities (Kankanhalli et al., 2005). Employees thus hide solicited knowledge to avoid incurring the expected direct and opportunity costs (Xiao, 2024; Xiong et al., 2021).

Aiming to clarify frequently asked questions, Bakker and Demerouti (2024) observe that JD–R theory research suggests, and (using the challenge-hindrance stressors framework) partly shows that job demands may be viewed as challenging and hindering, which can impact employees differently. Whereas both types of job demands bring costs for employee health by influencing the expected costs of solicited knowledge sharing, challenging job demands can motivate employees to influence the expected benefits of engaging in professional development activities, such as sharing the sought-after knowledge (Bakker & Demerouti, 2024). Meanwhile, hindering job demands can impair the motivation for professional development. However, Bakker and Demerouti (2024) argue that the JD–R theory research on the challenging job demands (e.g. job complexity) and hindering job demands (e.g. initiated interdependence) is incomplete. Whether job-design characteristics act as hindering or challenging job demands depends on an employee's subjective interpretation and perhaps on the type of occupation (Bakker & Sanz-Vergel, 2013). We have accordingly limited evidence to hypothesise the relationship between chosen job demands and expected benefits (Demerouti et al., 2001; Li et al., 2024; Zhang & Min, 2021). In sum, we find only sufficient evidence to support the hypothesis that job complexity and initiated interdependence as job demands stimulate the consideration of the expected direct and opportunity costs of solicited knowledge sharing to encourage knowledge hiding.

> H1: Job complexity (H1a) and initiated job interdependence (H1b) stimulate the expected direct costs and opportunity costs which, in turn, encourage knowledge hiding.

2.4. Job resources reduce knowledge hiding by affecting the expected cost-benefit analyses

Job resources are job-design characteristics that help fulfil job demands, lower the costs that arise from pursuing job demands, and motivate employees to engage in voluntary work growth and learning activities (Demerouti et al., 2001). Motivation is the reason that directs employees to (not) share solicited knowledge. Sharing solicited knowledge is a voluntary activity that improves actors' learning and performance, making it a work-growth activity (Černe et al., 2017). Accordingly, JD–R theory indicates two mechanisms *via* which job resources reduce knowledge hiding (Cheng et al., 2023; Li et al., 2024). First, job resources motivate employees to engage in solicited knowledge sharing. Second, job resources decrease the expected costs and thus lower knowledge hiding.

JD–R theory indicates that employees have three innate needs to satisfy: autonomy, competence and relatedness (Demerouti et al., 2001). Once these three innate needs are satisfied, employees feel motivated to engage in voluntary work-growth activities (e.g. sharing knowledge that has been solicited). The JD–R theory, as an overarching theory (Bakker & Demerouti, 2024), borrowed this explanation from the self-determination theory (Ryan & Deci, 2000). JD–R theory indicates that providing employees with job autonomy, skill variety, and received independence, respectively, satisfies their three innate motivations for autonomy, competence and relatedness (Bakker, 2015; Bakker Arnold & Demerouti, 2007). Zhang and Min (2021) state in the self-determination theory that after these innate motivations have been satisfied, employees expect and realise *non-financial benefits* and lower their expectations concerning *financial benefits*, reducing their hiding of knowledge.

Non-financial benefits refer to employees volitionally sharing the solicited knowledge because it will provide them with enjoyment and opportunities (e.g. reciprocating and learning relationships) to grow and perform (Gagné et al., 2019; Wang & Hou, 2015; Zhang & Min 2021; Azizi et al., 2023). The JD–R theory indicates that employees hide knowledge when they feel obliged to share solicited knowledge and obtain minimal or no personal and work-related benefits from solicited knowledge-sharing (Bakker Arnold & Demerouti, 2007; Bakker et al., 2023; Demerouti et al., 2001). Accordingly, knowledge-hiding literature indicates that non-financial benefits discourage knowledge-hiding (Zhang & Min, 2021). Non-financial benefits give employees a sense of personal volition and interest in sharing solicited knowledge rather than obligating them. Employees who enjoy sharing knowledge will

start discussing their work even when not asked to Gagné et al., (2019). Further, studies find that employees do not hide knowledge when they expect work-related non-financial rewards, such as future reciprocity or relationships, learning opportunities, and job security, that will improve work growth and performance (Connelly & Zweig, 2015; Zhang & Min, 2021).

On the contrary, *financial benefits* are additional monetary rewards (e.g. bonuses) that employees expect to receive in return for sharing solicited knowledge (Zhang & Min, 2021). The knowledge-hiding literature (Gagné et al., 2019) and JD–R theory (Bakker et al., 2023; Demerouti et al., 2001) suggest that employees who expect or are provided with financial benefits exhibit knowledge hiding (Zhang & Min, 2021). Financial benefits oblige employees to share sought-after knowledge to quickly secure the expected or provided financial benefits. They do not entail a sense of personal volition or purpose to share knowledge (Gagné et al., 2019). This means that employees share irrelevant or manipulated knowledge when they expect financial benefits, promoting the hiding of knowledge (Zhang & Min, 2021).

We provide additional arguments concerning how providing chosen job resources reduces knowledge hiding by affecting expected costs and benefits. Providing employees with job autonomy gives them flexibility and control over making decisions, (re)scheduling activities, and choosing efficient methods (Jia et al., 2024), affording ample time and energy for employees to engage in solicited knowledge-sharing and managing valued alternative opportunities simultaneously (Škerlavaj et al., 2018; Wu, 2020). Similarly, increasing skill variety in jobs prompts employees to develop their own and borrow colleagues' skills, knowledge and competencies, helping employees to manage alternative opportunities, thereby conserving time for solicited knowledge-sharing and promoting reciprocity and learning relationships between them (Hakanen et al., 2011; Wang, 2024; Wu, 2020). Increasing received interdependence makes work performance easy and quick to attenuate the expected costs (Škerlavaj et al., 2023). It also promotes interpersonal interactions that stress relationships based on non-financial benefits rather than financial benefits (Černe et al., 2017; Zhang & Min, 2021). In summary, access to the three chosen job resources provides employees with ample time and energy to decrease the direct and opportunity costs and motivate them to increase the non-financial benefits and lower the expected financial benefits, mitigating knowledge hiding.

> H2: Job autonomy (H2a), skill variety (H2b) and received interdependence (H2c) add to expected non-financial benefits and lower expected financial benefits, direct costs, and opportunity costs which, in turn, reduce knowledge hiding.

3. Methods and materials

3.1. Participants and data collection

We recruited participants from the Rawalpindi region in Pakistan. They were mainly working in five knowledge-intensive service industries: ICT (6.93%), research (40.96%), healthcare (4.52%), banking and finance (9.34%) and public administration (38.25%). We did not have exact population information about the targeted industries from the Pakistan Bureau of Statistics. Research assistants, therefore, paid in-person visits to different organisations and collected data with the agreement of the participating workers and organisations. The gender-segregation culture in Pakistan somewhat limits males from collecting data from females. This led us also to recruit a female research assistant to ensure female participation. The sample's gender distribution is thus close to the national gender distribution in the Pakistan Labour Force Survey 2021 (male 260 (78.31%) and female 72 (21.69%).

We collected data on the study variables from workers for two reasons. First, workers are better positioned than their colleagues and supervisors to evaluate their current job demands and resources, expected costs and benefits, and knowledge hiding (Connelly et al., 2014; Gagné et al., 2019). Second, JD–R theory literature suggests no substantial differences exist between employee-rated job demands and resources and supervisor-rated job demands and resources (Bakker et al., 2003; Demerouti et al., 2001). We conducted three-wave field surveys, each with a 1-month lag, to collect data on job demands and resources (Time 1), expected costs and benefits (Time 2), and knowledge hiding (Time 3). We received 374 responses at Time 1. We excluded 18 responses with missing values (leaving 356 responses). We received 349 responses at Time 2 (7 dropout responses). We excluded nine responses due to having missing values (leaving 340 responses). We received 338 responses at Time 3 (dropout responses 2) and dropped six because they were missing values. Accordingly, our study's usable sample size is 332, which is comparable to previous knowledge-hiding studies (Arain et al., 2024).

Our study participants were knowledge workers. We defined a knowledge worker as a person with at least one tertiary education qualification and doing knowledge-intensive jobs (Shujahat et al., 2021). Thus, we collected data from workers (e.g. engineers and managers) whose job specifications in Pakistan include holding a relevant university degree(s) and job experience (Shujahat et al., 2021). Having tertiary education qualification and experience in knowledge-intensive jobs allows knowledge workers to accumulate valuable knowledge that their

colleagues solicit, making knowledge hiding an essential element of their occupation (Arain et al., 2024). Accordingly, 55.12% of the respondents held at least a master's degree, while others (44.88%) had other higher education qualifications, including M.Phil. and PhDs. In addition, 87.63% of the sample had five or more years of experience, whereas 66.27% worked in middle and top management positions. The sampled respondents worked in different knowledge-intensive jobs, including but not limited to administrative (21.08%), IT (9.04%), finance (9.64%), marketing (5.12%), manufacturing (3.31%), research (31.33%), and healthcare work (3.61%).

3.2. Survey design and pre-testing

We designed the surveys in English. It is the official language of knowledge workers in Pakistan and the medium of their higher education and work training (Shujahat et al., 2021). Before collecting the data, we pre-tested the surveys with a research panel and then with a practitioner panel. Pre-testing ensures that survey questions are relevant, comprehensive, clearly articulated, and mutually exclusive from the respondents' perspective (Ruel et al., 2016). Each panel approved the questionnaire after three rounds of feedback.

Five international researchers who have demonstrated experience in publishing subject-matter research made up the research panel. The research panel chiefly provided feedback on the content validity of the proposed instruments for measuring the study constructs (variables). Content validity refers to how well a study's measure represents all relevant theoretical aspects it intends to assess. Hence, we incorporated minor modifications the panel recommended for the non-financial benefits, opportunity costs, and knowledge-hiding measures. For instance, based on the knowledge-hiding literature (Xiao & Cooke, 2019), the panel outlined that the expected loss of psychological ownership and power are also essential aspects of opportunity costs, which are not captured in the adopted Sun et al. (2014) measure. Following the panel's recommendation, we thus modified Sun's measure by adopting two additional items from Kankanhalli et al. (2005) to capture these essential aspects.

The practitioner panel comprised five knowledge workers from the targeted Pakistani industries. This panel ensured semantic validity, which assesses the extent to which the language and terminology used accurately convey the intended meaning to respondents. We incorporated the panel's recommendations concerning sentence structuring, presentation, and terminologies appropriate to the context of the targeted Pakistani workers and industries.

3.3. Measures

3.3.1. Job demands

We measure job demands using the instrument developed by Morgeson and Humphrey (2006). We measured job complexity using four items. We provide the measures in the appendix. A sample item of job complexity is 'My job is comprised of relatively complicated tasks'. The study's composite reliability for job complexity (0.86) exceeds the threshold value (0.7), exhibiting satisfactory internal consistency reliability (Table 1). Further, we measured initiated interdependence using three items. A sample item of initiated interdependence is 'Unless my job gets done, other jobs cannot be completed'. Our study's composite reliability for initiated interdependence is 0.78.

3.3.2. Job resources

We measured job resources using the instrument Morgeson and Humphrey (2006) developed. Thus, we measured job autonomy using three dimensions: decision-making, method, and scheduling autonomy. Nine items in total were employed, using three items for each dimension. A sample item of job autonomy is 'My job allows me to plan how I do my work'. The study's composite reliability for job autonomy is 0.92. Moreover, we measured skill variety using four items. A sample item of skill variety is 'My job requires me to utilise a variety of different skills to complete the work'. The study's composite reliability for skill variety is 0.86. In addition, we measured received interdependence with three items. A sample item of received interdependence is 'My job depends on the work of many different people for its completion'. The study's composite reliability for received interdependence is 0.84.

3.3.3. Expected direct and opportunity costs

We assessed the expected direct costs using Sun et al.'s (2014) three-item measure. This measure captures how employees expect an immediate loss of valued work outcomes when sharing solicited knowledge (e.g. time and energy). A sample item is 'I may not share solicited knowledge with colleagues due to… it may take too much time'. Our study's composite reliability for the direct costs is 0.81.

We measured the opportunity costs using five items. We adapted Sun et al. (2014) three-item measure. The measure captures how employees expect to lose valued alternative opportunities (e.g. pursuing work) while sharing solicited knowledge. This measure is based on Kankanhalli et al. (2005). A sample item is 'I may not share solicited knowledge with colleagues due to… sharing the knowledge with others will make me lose an opportunity to do valued alternative things (e.g. job tasks)'. Further,

Table 1. Measurement model results.

Construct	Mean	SD	VIF	CR	AVE	1	2	3	4	5	6	7	8	9	10
1. Job autonomy	3.78	0.80	1.33	0.92	0.80	0.89	0.36	0.52	0.25	0.18	0.43	0.24	0.26	0.14	0.21
2. Job complexity	3.85	0.78	1.87	0.86	0.60	0.34**	0.77	0.66	0.29	0.27	0.41	0.28	0.25	0.19	0.13
3. Skill variety	4.11	0.70	2.07	0.86	0.60	0.49**	0.66**	0.77	0.25	0.20	0.6	0.10	0.11	0.01	0.03
4. Initiated interdependence	3.37	0.91	1.60	0.78	0.54	0.24**	0.29**	0.25**	0.73	0.59	0.23	0.31	0.37	0.37	0.40
5. Received interdependence	3.45	0.96	1.55	0.84	0.63	0.17**	0.27**	0.20**	0.59**	0.79	0.32	0.30	0.38	0.34	0.34
6. Non-financial benefits	4.03	0.61	1.08	0.81	0.69	0.29**	0.30**	0.47**	0.15**	0.20**	0.83	0.41	0.37	0.41	0.42
7. Financial benefits	2.78	1.33	1.72	0.92	0.86	0.23**	0.28**	0.10	0.31**	0.30**	0.13*	0.93	0.6	0.59	0.58
8. Direct costs	2.93	0.97	2.59	0.81	0.58	0.24**	0.25**	0.11*	0.37**	0.38**	0.07	0.60**	0.76	0.76	0.70
9. Opportunity costs	2.48	1.12	2.66	0.92	0.68	0.13*	0.19**	0.01	0.37**	0.34**	-0.08	0.59**	0.76**	0.82	0.80
10. Knowledge hiding	3.01	1.20	3.19	0.86	0.55	0.20**	0.13*	-0.03	0.40**	0.34**	-0.09	0.58**	0.70**	0.80**	0.74

Note: Significance levels: *$p<0.05$; **$p<0.01$; SD: Standard deviation; CR: Composite reliability; AVE: Average variance extracted.
Diagonal and italicised elements are the square roots of the AVE (average variance extracted).
Below the diagonal elements are the correlations between the constructs' values.
Above the diagonal elements are the HTMT values.

our literature review (Xiao, 2024) and the research pre-testing panel indicated that the Sun et al. (2014) measure does not capture the relevant opportunity costs of psychological ownership and power of the solicited knowledge. This led us to adapt two additional items from Kankanhalli et al. (2005) to measure these relevant opportunity costs. A sample item is 'I may not share solicited knowledge with colleagues due to… sharing the knowledge with others will make me lose my power and unique value in the organisation'. The study's composite reliability for the opportunity costs is 0.92.

3.3.4. Expected financial and non-financial benefits

We primarily used Wang and Hou's (2015) renowned measure to assess the expected financial and non-financial benefits. This measure, in turn, is developed based on multiple other measures (Kankanhalli et al., 2005; Lin, 2007). Two items measured how employees expect additional monetary rewards (salary and bonus) for sharing solicited knowledge. A sample item is 'I expect to receive monetary rewards (e.g. bonuses) in return for sharing my knowledge with my colleagues'. Our study's composite reliability for the financial benefits is 0.92.

The study's composite reliability for expected non-financial benefits is 0.81. Based on the knowledge-hiding literature, we measured the expected non-financial benefits using two dimensions: enjoyment and work-related non-financial rewards (Gagné et al., 2019; Wang & Hou, 2015; Zhang & Min, 2021). Expected enjoyment is anticipating gaining pleasure by sharing the knowledge one possesses with others upon request. We measured the enjoyment dimension with four items (Lin, 2007; Wang & Hou, 2015). A sample item is 'I enjoy helping colleagues by sharing my knowledge'. The dimension of work-related non-financial rewards captures how employees expect specific opportunities to grow and perform by sharing solicited knowledge. We measured the dimension of work-related non-financial rewards using four items, which capture employee sharing solicited knowledge due to expecting reciprocity, job security, and learning opportunities or relationship (Lin, 2007; Wang & Hou, 2015). The knowledge-hiding literature establishes that employees do not hide solicited knowledge when they expect these three work-related non-financial rewards or opportunities to grow and perform (Škerlavaj et al., 2023; Xiao, 2024). A sample item is 'I expect to receive opportunities to learn from others *via* sharing my knowledge with my colleagues'.

3.3.5. Knowledge hiding

The literature review reveals that the expected costs and benefits lead to overall knowledge hiding. Accordingly, following previous research (Connelly & Zweig, 2015; Hernaus et al., 2019; Montani et al., 2024) and

the research pre-testing panel's recommendation, we measure overall knowledge hiding rather than specific type(s) of knowledge hiding (e.g. rationalising, playing dumb, and evading (Connelly et al., 2012). Montani et al. (2024) state that measuring overall knowledge hiding minimises the survey length to prevent a low response rate. Accordingly, we adopted Peng's (2013) three-item measure and two additional relevant items from Lin and Huang (2010) to measure knowledge hiding. A sample item is 'I hide innovative solutions if other colleagues ask me about job-related problems'. The study's composite reliability for knowledge hiding is 0.86.

3.3.6. Control variables

Following Becker (2005), we collected data for only theoretically relevant control variables to avoid measurement errors. Thus, based on the knowledge-hiding research, we collected data on several control variables, including organisational knowledge-sharing support, gender, industry, education qualification, managerial position, time to retirement, and years of organisational and overall experience. For instance, Arain et al. (2024) meta-analysis revealed that knowledge hiding varies according to employee gender and industry. Further, organisational knowledge-sharing support affects knowledge hiding (Škerlavaj et al., 2023). We, therefore, measured organisational knowledge-sharing support using five items from Lin (2006), capturing how the organisation provides various types of support (e.g. culture, managerial, IT systems, rewards) to its employees to facilitate solicited knowledge sharing.

3.4. Proactive measures for mitigating and assessing survey biases

3.4.1. Common method bias and social desirability bias

Common method bias occurs when the same person, measurement context, and/or item characteristics are used for collecting data on independent and dependent variables. Social desirability bias arises when respondents conceal their genuine opinions to give a good expression to others. We collected three-wave, time-lagged data to mitigate common method and social desirability bias (Podsakoff et al., 2024). Further, we measured knowledge hiding on a seven-point Likert scale and assessed the remaining constructs on a five-point Likert scale (1 = strongly disagree to 5 or 7 = strongly agree). HRM literature shows precedence for measuring knowledge hiding on a seven-point Likert scale (e.g. Škerlavaj et al., 2018; Zhang & Min, 2021).

Following Simmering et al. (2015), we used the marker variable approach to assess common method bias. The mentioned approach intentionally adds an unrelated variable to the study variables. The poor correlation of the marker variable with the study variables indicates the

absence of common method bias. We used employee attitude to the colour blue as a marker variable, which captured the degree to which an employee prefers blue as a colour (Usman et al., 2024). The marker variable exhibited satisfactory reliability and validity (composite reliability = 0.83; average variance extracted = 0.63). We found non-significant correlations between the marker variable and study variables, suggesting the absence of common method bias.

3.4.2. Non-response bias

Non-response bias occurs when individuals responding to a survey differ significantly from those who do not. To proactively control non-response bias, we designed a concise yet comprehensive questionnaire through pre-testing and assured the anonymity of participants (Fulton, 2018). Accordingly, using Pearson's chi-square test, we find no significant differences ($p > 0.05$) between the demographics of the respondents (gender, industry, education qualification, and experience) who dropped out of the survey waves and those who were in the final sample.

3.4.3. Endogeneity

Endogeneity occurs when the independent and dependent variables simultaneously affect each other. To proactively reduce endogeneity, the JD–R theory (Demerouti et al., 2001), a 23-year-old theory, and about ten years of knowledge-hiding literature (Connelly et al., 2014) inform the direction of causality between the study's variables. Endogeneity manifests when an independent variable is correlated with the error term of the dependent variable, causing biased results. We assess endogeneity using the Gaussian copula approach. The approach identifies the independent variables correlated with the error term of a dependent variable and introduces a copula term capturing the correlation (Hair et al., 2022). Thus, following the procedure described in Hult et al. (2018), we applied Park and Gupta's (2012) Gaussian copula approach using latent-variance scores. None of the Gaussian copula models (whether single or multiple variables) included as dependent variables was found to be significant ($p > 0.05$). We, accordingly, do not detect endogeneity in the study's research model.

3.5. Data analysis technique

We employed the partial least squares (PLS) path modelling technique. After debates (Henseler et al., 2014; McIntosh et al., 2014), a stream of literature suggests that composite-based structural equation modelling (SEM) techniques are more appropriate than factor-based SEMs while analysing composite constructs (Hair et al., 2017; Hair & Sarstedt, 2019).

Our research model is mainly composed of composite constructs. Consequently, we apply the PLS path modelling, a composite-based SEM. Our sample size of 332 exceeds the minimum required sample size (91) for conducting PLS analysis (power 80%, significance level 5%, $R^2 < 0.25$), and the maximum number of arrows pointing at the study's construct is five (Cohen, 1992).

We used SmartPLS 4 software to conduct the PLS path modelling. We followed the seminal guidelines of PLS (Hair et al., 2022) while conducting the data analysis and reporting results. We applied the PLS algorithm option using the software's basic settings. We used the items' and dimensions' latent scores. We modelled job autonomy and non-financial benefits by treating them as second-order reflective constructs for their dimensions. The remaining variables were modelled as unidimensional reflective constructs.

3.5.1. Control variables

Following Becker (2005), we used the control variables meaningfully in our research model. Hence, our correlation analyses, followed by the path analyses, revealed that the chosen theoretically relevant control variables are not significantly associated with knowledge hiding. We, therefore, did not employ the control variables to avoid measurement errors.

4. Results

4.1. Measurement model

The measurement model assesses the reliability and validity of the study's constructs (Hair et al., 2022). Our results demonstrate satisfactory construct reliability and validity statistics. Our study's construct composite reliability scores range between 0.78 and 0.92, suggesting adequate internal consistency construct reliability (Hair et al., 2022). Similarly, the average variance extracted (AVE) value of all constructs ranges between 0.50 and 0.86, confirming the construct convergent validity (see the diagonal and italicised elements in Table 1) (Hair et al., 2022). We establish discriminant validity through the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). Following the Fornell-Larcker criterion, for each pair of constructs, the square root of the AVEs of each construct (italicised values on the diagonal in Table 1) is higher than the absolute value of its highest correlation with other constructs (values below the diagonal in Table 1) (Hair et al., 2022). In addition, the HTMT values are below the threshold of 0.85, and neither the lower nor the upper confidence interval includes a value of 1.0 (see values above the diagonal in Table 1) (Hair et al., 2022).

4.2. Structural model

The structural model assesses the relationships between the study variables to test the hypotheses. An adequate evaluation of the structural model (Hair et al., 2022) involves examining the in-sample predictive power (R^2), strength and significance level of path coefficients, and effect size (f^2). Our structural model explains the satisfactory variance (R^2) of independent variables in the dependent variables, including 23% (direct costs), 21% (opportunity costs), 12% (financial benefits), 24% (non-financial benefits) and 67% (knowledge hiding). These variance statistics, especially the 67% variance explained in knowledge hiding, suggest adequate in-sample predictive power through our integration of the cost-benefit analysis framework into the JD–R theory. The effect size (f^2) analyses the impact of an independent variable relative to others on a dependent variable. Effect sizes of 0.02, 0.5 and 0.35 are considered small, medium and large, respectively (Hair et al., 2022). In our study, opportunity cost has the largest effect size (0.37) in knowledge hiding, followed by skill variety (0.17) in non-financial benefits. Other independent constructs have smaller effect sizes (Table 2).

We tested the study's hypotheses as follows. We hypothesised how job demands (job complexity (H1a) and initiated interdependence (H1b) stimulate expected direct and opportunity costs that, in turn, encourage knowledge hiding. We find support for H1a and H1b as follows. We found positive relationships between job complexity and direct costs ($\beta = 0.21$, $p < 0.05$, $f^2 = 0.03$) and opportunity costs ($\beta = 0.23$, $p < 0.01$, $f^2 = 0.03$). We also found positive relationships between initiated interdependence and direct costs ($\beta = 0.18$, $p < 0.001$, $f^2 = 0.03$) and opportunity costs ($\beta = 0.25$, $p < 0.001$, $f^2 = 0.05$). As expected, we found that direct costs ($\beta = 0.19$, $p < 0.001$, $f^2 = 0.04$) and opportunity costs ($\beta = 0.57$, $p < 0.001$, $f^2 = 0.37$) encourage knowledge hiding. Mediation analyses how independent variables (job demands and resources) influence the dependent variable (knowledge hiding) *via* mediating variables (expected costs and benefits). Accordingly, our additional mediation analyses (Table 3) reveal how direct costs and opportunity costs mediate between job complexity and knowledge hiding (direct costs ($\beta = 0.04$, $p < 0.05$); opportunity costs ($\beta = 0.13$, $p < 0.01$) and initiated interdependence and knowledge hiding (direct costs ($\beta = 0.03$, $p < 0.05$); opportunity costs ($\beta = 0.14$, $p < 0.001$). In sum, we find support for H1a and H1b.

We hypothesised how job resources (job autonomy (H2a), skill variety (H2b), and received interdependence (H2c) increase expected non-financial benefits and lower expected financial benefits and direct and opportunity costs, which, in turn, reduce knowledge hiding. We find no support for H2a. Job autonomy is associated positively but non-significantly with

Table 2. Structural model results.

Structural Path	Standardized Path coefficient	p-value	Significant difference ($p < 0.05$)?	95% BCa Confidence interval	Effect size (f^2)	Conclusion
Direct costs → Knowledge hiding	0.19	0.00***	Yes	[0.09, 0.29]	0.04	Supported
Opportunity costs → Knowledge hiding	0.57	0.00***	Yes	[0.46, 0.67]	0.37	Supported
Financial benefits → Knowledge hiding	0.14	0.00**	Yes	[0.07, 0.22]	0.04	Supported
Non-financial benefits → Knowledge hiding	−0.08	0.02*	Yes	[-0.14, −0.02]	0.02	Supported
Job complexity → Direct costs	0.21	0.02*	Yes	[0.08, 0.34]	0.03	Supported
Job complexity → Opportunity costs	0.23	0.00**	Yes	[0.12, 0.33]	0.03	Supported
Initiated interdependence → Direct costs	0.18	0.00***	Yes	[0.09, 0.28]	0.03	Supported
Initiated interdependence → Opportunity costs	0.25	0.00***	Yes	[0.14, 0.35]	0.05	Supported
Job autonomy → Direct costs	0.19	0.00***	Yes	[0.11, 0.27]	0.04	Not supported
Job autonomy → Opportunity costs	0.10	0.05*	Yes	[0.14, 0.35]	0.01	Not supported
Job autonomy → Financial benefits	0.21	0.00***	Yes	[0.01, 0.20]	0.04	Not supported
Job autonomy → Non-financial benefits	0.08	0.09 ns	No	[-0.02, 0.19]	0.01	Not supported
Skill variety → Direct costs	−0.22	0.00***	Yes	[-0.33, −0.11]	0.03	Supported
Skill variety → Opportunity costs	−0.29	0.00***	Yes	[-0.40, −0.17]	0.05	Supported
Skill variety → Financial benefits	−0.06	0.16ns	No	[-0.15, 0.04]	0.00	Not supported
Skill variety → Non-financial benefits	0.42	0.00***	Yes	[0.31, 0.51]	0.17	Supported
Received interdependence → Direct costs	0.23	0.00***	Yes	[0.13, 0.32]	0.04	Not supported
Received interdependence → Opportunity costs	0.17	0.00**	Yes	[0.08, 0.27]	0.02	Not supported
Received interdependence → Financial benefits	0.27	0.00***	Yes	[0.18, 0.36]	0.08	Not supported
Received interdependence → Non-financial benefits	0.09	0.05*	Yes	[0.01, 0.18]	0.01	Supported

$R^2_{\text{(Direct costs)}} = 0.23$; $R^2_{\text{(Opportunity costs)}} = 0.21$;
$R^2_{\text{(Financial benefits)}} = 0.12$; $R^2_{\text{(Non-financial benefits)}} = 0.24$;
$R^2_{\text{(Knowledge hiding)}} = 0.67$

Note: ns = non-significant; t (0.05, 4999) = 1.645; t (0.01, 4999) = 2.327; t (0.001, 4999) = 3.092.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, based on t (4999), one-tailed test.
BCa: Bias corrected confidence interval. Bootstrapping based on $n = 5000$ subsamples.

non-financial benefits ($\beta = 0.08^{ns}$, $p > 0.05$, $f^2 = 0.01$), whereas, unexpectedly, it is positively associated with financial benefits ($\beta = 0.21$, $p < 0.001$, $f^2 = 0.04$), direct costs ($\beta = 0.19$, $p < 0.001$, $f^2 = 0.04$) and opportunity costs ($\beta = 0.10$, $p < 0.05$, $f^2 = 0.01$). As expected, we find how expected financial benefits ($\beta = 0.14$, $p < 0.01$, $f^2 = 0.04$), direct costs ($\beta = 0.19$, $p < 0.001$, $f^2 = 0.04$), and opportunity costs ($\beta = 0.57$, $p < 0.001$, $f^2 = 0.37$), encourage knowledge hiding, whereas expected non-financial benefits mitigate it ($\beta = -0.08$, $p < 0.05$, $f^2 = 0.02$). Our mediation analyses reveal how direct costs ($\beta = 0.04$, $p < 0.01$) and financial benefits ($\beta = 0.03$, $p < 0.05$) mediate

Table 3. Mediation analysis results.

Structural Path	Standardized Path coefficient	p-value	Significant difference ($p < 0.05$)?	95% BCa Confidence interval
Job complexity → Direct costs → Knowledge hiding	0.04	0.03*	Yes	[0.01, 0.08]
Job complexity → Opportunity costs → Knowledge hiding	0.13	0.00**	Yes	[0.07, 0.20]
Initiated interdependence → Direct costs → Knowledge hiding	0.03	0.01*	Yes	[0.01, 0.07]
Initiated interdependence → Opportunity costs → Knowledge hiding	0.14	0.00***	Yes	[0.08, 0.22]
Job autonomy → Direct costs → Knowledge hiding	0.04	0.01**	Yes	[0.02, 0.07]
Job autonomy → Opportunity costs → Knowledge hiding	0.06	0.07ns	No	[-0.01, 0.13]
Skills variety → Direct costs → Knowledge hiding	−0.04	0.02*	Yes	[-0.08, −0.02]
Skills variety → Opportunity costs → Knowledge hiding	−0.16	0.00***	Yes	[-0.25, −0.09]
Received interdependence → Direct costs → Knowledge hiding	0.04	0.01**	Yes	[0.02, 0.08]
Received interdependence → Opportunity costs → Knowledge hiding	0.10	0.00***	Yes	[0.05, 0.16]
Job autonomy → Non-financial benefits → Knowledge hiding	0.03	0.12ns	No	[-0.02, 0.00]
Job autonomy → Financial benefits → Knowledge hiding	0.03	0.02*	Yes	[0.01, 0.06]
Skills variety → Non-financial benefits → Knowledge hiding	−0.03	0.02*	Yes	[-0.06, −0.01]
Skills variety → Financial benefits → Knowledge hiding	−0.01	0.19ns	No	[-0.03, 0.00]
Received interdependence → Non-financial benefits → Knowledge hiding	−0.01	0.09ns	No	[-0.02, 0.00]
Received interdependence → Financial benefits → Knowledge hiding	0.04	0.01**	Yes	[0.02, 0.07]

Note: ns: non-significant; t (0.05, 4999) = 1.645; t (0.01, 4999) = 2.327; t (0.001, 4999) = 3.092.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, based on t (4999), one-tailed test.
BCa: Bias corrected confidence interval. Bootstrapping based on $n = 5000$ subsamples.

between job autonomy and knowledge hiding, whereas opportunity costs ($\beta = 0.06^{ns}$, $p > 0.05$) and non-financial benefits ($\beta = -0.01^{ns}$, $p > 0.05$) do not. In sum, we find little or no support for H2a that job autonomy reduces knowledge hiding.

We find extensive support for H2b. We find how skill variety associates significantly and positively with non-financial benefits ($\beta = 0.42$, $p < 0.001$, $f^2 = 0.17$) and negatively with direct costs ($\beta = -0.22$, $p < 0.001$, $f^2 = 0.03$) and opportunity costs ($\beta = -0.29$, $p < 0.001$, $f^2 = 0.05$), which, in turn, mitigate knowledge hiding. However, skill variety is associated negatively but non-significantly with financial benefits ($\beta = -0.06^{ns}$, $p > 0.05$, $f^2 = 0.00$). Our mediation analyses indicate how expected direct costs ($\beta = -0.04$, $p < 0.05$), opportunity costs ($\beta = -0.16$, $p < 0.001$), and non-financial benefits ($\beta = -0.03$, $p < 0.05$) mediate between skill variety and knowledge hiding, whereas the financial benefits ($\beta = -0.01^{ns}$, $p > 0.05$) do not.

We find minor support for H2c. Not only the received interdependence is positively and significantly associated with non-financial benefits

($\beta = 0.09$, $p < 0.05$, $f^2 = 0.01$), but it is also with financial benefits ($\beta = 0.27$, $p < 0.001$, $f^2 = 0.08$), direct costs ($\beta = 0.23$, $p < 0.001$, $f^2 = 0.04$), and opportunity costs ($\beta = 0.17$, $p < 0.01$, $f^2 = 0.02$). Our mediation analyses indicate how direct costs ($\beta = 0.04$, $p < 0.01$), opportunity costs ($\beta = 0.10$, $p < 0.01$), and financial benefits ($\beta = 0.04$, $p < 0.01$) mediate between received interdependence and knowledge hiding, whereas the non-financial benefits ($\beta = -0.01^{ns}$, $p > 0.05$) do not.

5. Discussion

By integrating the cost-benefit analysis framework (Blau, 1964) into the JD–R theory (Demerouti et al., 2001), we examined how job demands and resources are two distinct types of job-design characteristics that influence the expected costs and benefits, which affect knowledge hiding in different ways, which is an employee's rational choice and counterproductive behaviour. In sum, we find that the job complexity and initiated interdependence as the chosen job demands encourage knowledge hiding by stimulating the expected direct and opportunity costs. Further, skill variety as a job resource lowers knowledge hiding by reducing the expected costs and financial benefits and increasing the expected non-financial benefits. Unexpectedly, job autonomy and received interdependence as job resources produce mixed effects on knowledge hiding. Whereas they may increase the expected non-financial benefits to mitigate knowledge hiding, they also increase the expected financial benefits and direct and opportunity costs to encourage it.

We offer three primary theoretical contributions. First, we contribute to the HRM literature on the motivating role of job design in mitigating knowledge hiding (Gagné et al., 2019). We contribute by showing that the job demands and resources, as two distinct types of job-design characteristics, affect knowledge hiding differently by influencing the expected costs and benefits. Second, we explain the unexpected findings in the HRM literature in the motivational theories regarding why and how job-design characteristics (e.g. initiated interdependence (Gagné et al., 2019) and job complexity (Zhang & Min, 2021) do not motivate to reduce but actually encourage knowledge hiding. This HRM literature did not find support for its proposition in the self-determination theory that job-design characteristics mitigate knowledge hiding by motivating employees (Gagné et al., 2019) to realise the expected non-financial benefits and decrease the expected financial benefits (Zhang & Min, 2021). However, the HRM literature in the motivational theories on using job design to motivate employees (Parker, 2014) for managing newly established employee behaviours (Foss et al., 2009; Gagné et al., 2019) lacked the two critical nuances of the job demands and resources distinction of

the job-design characteristics (Demerouti et al., 2001) and the expected cost mechanism (Xiong et al., 2021). Integrating the cost-benefit analysis framework into the JD–R theory gave us these two nuances, which help explain the unexpected findings in the HRM literature.

We contribute by showing that the job demands encourage knowledge hiding by stimulating the expected costs. Our additional analyses, available from the corresponding author upon request, indicate that the absence of or pursuing two chosen job demands, especially job complexity, does not motivate employees to increase the non-financial benefits significantly and decrease the expected financial benefits, affecting knowledge hiding. These results refute the HRM literature that applies motivational theories to propose, without distinguishing job demands from job resources and incorporating the expected cost mechanism, that the job-design characteristics motivate employees to help manage newly established employee behaviours (e.g. knowledge hiding (Gagné et al., 2019) and knowledge sharing (Foss et al., 2009). Further, these results do not find evidence to support the JD–R theory literature in the challenge-hindrance stressors framework, which proposes that job complexity as a challenging job demand may not only boost the expected costs but also motivate employees to increase non-financial benefits and decrease the expected financial benefits (Bakker & Demerouti, 2024).

Further, by integrating the cost-benefit analysis framework into the JD–R theory, we contribute to the HRM literature on knowledge hiding that job resources (e.g. skill variety) reduce knowledge hiding by not only motivating employees (Gagné et al., 2019) to influence the expected financial and non-financial benefits (Zhang & Min, 2021) but also by lowering the expected costs. These results partly support the HRM literature on the motivational theories which propose, without distinguishing between job demands and job resources and incorporating the expected cost mechanism, that the job-design characteristics motivate employees to manage newly established employee behaviours (Foss et al., 2009; Gagné et al., 2019).

Unlike skill variety, we find that job autonomy and received interdependence as job resources do not mitigate knowledge hiding the most promisingly. Whereas they may mitigate knowledge hiding by stimulating the expected non-financial benefits, they also encourage it by increasing the expected financial benefits and direct and opportunity costs. Arain et al.'s (2024) meta-analysis also found that providing job autonomy and received interdependence encourages knowledge hiding. These results also align with the emerging literature on the unintended side effects of job resources on employee behaviours (Johns, 2010). Our additional analyses revealed that the demographics and organisational knowledge-sharing climate as control variables do not provide plausible explanations

for these contradictory results. Further, our additional analyses also show that the effect of the three measured forms of job autonomy, including the discretion to schedule work, choose methods, and make decisions, does not vary to explain these contradictory results plausibly (e.g. (Stiglbauer & Kovacs, 2018).

Therefore, we provide two plausible explanations for the mixed effects of these job resources on knowledge hiding that future research should examine. First, the job characteristic theory indicates that employees' feeling of job responsibility could moderate the mixed effects of job autonomy and received interdependence on knowledge hiding (Hackman & Oldham, 1975). For instance, Lu et al. (2017) established that employees with high job autonomy behave unethically until they start feeling job responsibility. Accordingly, employees experiencing high job responsibility would use the additional time and energy the job resources provide to share the solicited knowledge. Second, the fit between or difference in an employee's desired or required levels of job resources and the available levels in the person-job fit theory can explain the mixed effects (Gargiulo et al., 2009; Stiglbauer & Kovacs, 2018). For instance, providing a higher level of job autonomy than an employee's required levels fuels too many feelings of competence to inhibit the innate motivation for relatedness (Demerouti et al., 2001) such that employees may start expecting a high level of financial benefits and costs (Connelly et al., 2014). Similarly, a higher degree of received interdependence in the job than what the employee requires fuels too many feelings of dependence on others to inhibit the innate motivation for autonomy (Gargiulo et al., 2009). In summary, future research may investigate whether the moderating role of felt job responsibility and the difference in the required and available levels of job resources can explain such contradictory results.

Third, whereas the JD–R theory focuses on how job demands and resources affect employee health impairment or cost and motivational mechanisms distinctively to affect employee well-being and performance outcomes (Bakker & Demerouti, 2024), we integrate the cost-benefit analysis framework into the JD–R theory to contribute the distinctive mediating role of employee rationality-based expected cost-benefit analyses (Bakker & Demerouti, 2024). Accordingly, we offer nuanced empirical evidence that supports the hint provided by Cham et al. (2021) that health impairment and motivation mechanisms may also stimulate the expected cost-benefit analyses to influence employee rational choice and (counter)productive work outcomes. We indicate that high job demands exhaust employees' time and energy (Cham et al., 2021), raising expected direct and opportunity costs to encourage knowledge hiding. Access to job resources refills the exhausted time and energy to increase the expected direct and opportunity costs, reducing knowledge hiding.

Further, it motivates employees to realise the expected non-financial benefits and decreases the expected financial benefits, mitigating knowledge hiding. Thus, integrating the cost-benefit analysis framework significantly broadens the application of the JD–R theory's scope from employee well-being and performance outcomes to rational-choice work behaviours.

5.1. Theoretical implications

By integrating the cost-benefit analysis as another mechanism into the JD–R theory, the extended JD–R theory can now study the impact of job characteristics on a range of employee rational choice and counter(productive) behaviours (e.g. knowledge sabotage (Serenko, 2019), going beyond the theory's typical scope of employee well-being and performance outcomes (Bakker & Demerouti, 2024). This extension is critical because HRM research is ever more interested in how job design affects and can help manage newly established employee challenges or (counter)productive and rational choice behaviours on various levels. Accordingly, we argue that the JD–R theory (Bakker & Demerouti, 2024) is a better theoretical perspective than the motivational theories of job design (Hackman & Oldham, 1975; Ryan & Deci, 2000) for studying the motivating role of job design in managing various types of employee behaviours (e.g. rational choice, well-being, performance behaviours). The JD–R theory can subsume explanations of the motivational theories and those of other theories (e.g. cost-benefit analysis framework) to provide a more nuanced view of the different effects of job-design characteristics as the job demand and resource types on employee work behaviours through expected costs and motivational (benefits) mechanisms.

We believe that motivational theories do not offer such nuanced effects and mechanisms. Future HRM research should accordingly abstain from this trend of exclusively relying on motivational theories (Foss et al., 2009; Gagné et al., 2019) to understand the motivating role of job design for managing newly established employee work outcomes until there is substantial evidence that job-design characteristics may have the same impact and motivation is the prime reason for the given employee behaviour (e.g. (Knight & Parker, 2021).

5.2. Managerial implications

We recommend that HR practitioners design and allow employees to craft low job demands and increased job resources to reduce knowledge hiding. HR practitioners (re)analyse and intervene in the job (re)design to lower demands and resources in different stages of the HRM process (e.g. while writing job descriptions for recruitment, hearing complaints about employee

counterproductive behaviours, and workforce planning for an organisational change). Further, they should provide those job resources (e.g. skill variety) that mitigate knowledge hiding the most promisingly, entailing no mixed effect. In addition, we caution that providing specific job resources (e.g. job autonomy) can produce mixed effects on knowledge hiding if certain conducive conditions (e.g. felt job responsibility) are absent. Practitioners should, therefore, only provide such double-edging job resources if such conducive conditions are in place. Through job crafting, employees also lower job demands and increase job resources (Bakker & Demerouti, 2024). Accordingly, HR practitioners should facilitate employees' attempts to craft jobs with optimal job demands and sufficient job resources to maintain health and motivate them to abstain from counterproductive outcomes, such as knowledge hiding.

6. Conclusion

Knowledge hiding is often a significant barrier to the performance of those involved. Previous HRM literature examined how job design is a seminal, organic, and inexpensive HRM practice that can motivate employees to help manage knowledge hiding and other employee work outcomes. By integrating the cost-benefit analysis framework into the JD–R theory, we advanced how job demands and resources are two distinct types of job-design characteristics that affect employee outcomes differently. We contribute to the HRM literature on how job demands encourage knowledge hiding by increasing the expected costs. Further, how job resources mitigate knowledge hiding by increasing the expected non-financial benefits and lowering the expected costs and financial benefits. We contribute to the JD–R theory by adding how expected costs and benefits mediate the effect of job demands and resources on employee rational choice and counterproductive behaviours. By integrating the cost-benefit analysis framework into the JD–R theory, the expanded JD–R theory can now study the impact of job characteristics on a range of employee rational-choice behaviours, expanding its scope from employee well-being and performance outcomes to the employee rational-choice and (counter)productive outcomes. We suggest that the extended JD–R theory is more promising for studying the role of job design in employee work outcomes than the motivational theories for the two nuances of the job demands and resources and expected costs and benefits (motivational) mechanisms.

6.1. Research limitations and recommendations

We acknowledge two limitations. First, due to limited capacity, the study could not examine an exhaustive number of job demands and resources

and employee outcomes. Quantitative design limits studies to selecting only a few variables. Future studies could examine the impact of any remaining core job demands and resources (Morgeson & Humphrey, 2006). Second, we collected data from specific Pakistani industries using convenience sampling. Future studies could use probability sampling techniques in other contexts to allow comparative analysis.

We outline the following future research areas. First, as elaborated in the discussion section, we recommend investigating the potential roles of the job (felt) responsibility and the fit between available and desired job resources as contingencies to explain the mixed effects of job autonomy and received interdependence. Second, it is essential to consider that employees might weigh the costs and benefits of solicited knowledge sharing and the potential costs associated with hiding knowledge, such as a deterioration of interpersonal trust (Connelly & Zweig, 2015). Although our study's measure of non-financial benefits somewhat captures such aspects (e.g. reciprocity and relationship), future research could incorporate the expected costs of knowledge hiding in the study's research model. Third, future research may investigate how various types of motivations (Gagné et al., 2019) fully mediate between the job resources and expected benefits (Zhang & Min, 2021). Fourth, future research should also consider other rational-choice behaviours of employees on various levels (e.g. knowledge sabotage on individual and unit levels). Finally, we recommend that future knowledge-hiding research consider using qualitative methods. We observe that the knowledge-hiding literature lacks this method. Qualitative methods are advantageous because they can explain the in-depth context of whether, why, when, and how, for instance, job design affects knowledge hiding.

Note

1. The organizational norms of good citizenship and collegiality expect employees to share solicited knowledge if they hold it (Černe et al., 2017). Accordingly, when colleagues request knowledge, under these expectations, employees, as rational beings, are prompted to assess the benefits and costs of sharing the solicited knowledge. Therefore, in these studies (Gagné et al., 2019; Zhang & Min, 2021), and therefore we examined the expected costs and benefits of solicited knowledge-sharing. This is not to say that the expected costs and benefits of knowledge-hiding do not affect it (e.g., Connelly & Zweig, 2015).

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Data availability statement

The study participants did not give written consent to share their data publicly. Thus, given the sensitive nature of the research, supporting data are not available.

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