

## Antecedents and Consequences of Digital Technology Job Insecurity Among Older Employees

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### Abstract

While digital transformation brings new opportunities to enterprise operations management, it also engenders a novel managerial challenge—the digital divide among older employees. Confronted with rapidly evolving and highly complex digital technologies, older employees commonly experience difficulties in adaptation and even fear replacement by digital technology, thereby triggering digital technology job insecurity. Based on this premise, the present research centers on “older employees’ digital technology job insecurity” as its core theme, systematically investigating its antecedent mechanisms and consequential outcomes. Specifically: First, from a theoretical perspective, it clarifies the conceptual connotation and dimensional structure of older employees’ digital technology job insecurity and develops corresponding measurement instruments; Second, grounded in person-context interaction theory, it thoroughly examines the effects of aging digital technology capability stereotypes, positive attitudes toward digital technology, and intrinsic motivation for digital technology learning on older employees’ digital technology job insecurity, along with the boundary role of developmental human resource management practices; Third, based on life development motivation theory, it analyzes the pathways through which older employees’ digital technology job insecurity influences their behavioral performance, and investigates the moderating roles of growth mindset and organizational digital technology support. This study provides theoretical support and practical guidance for addressing the challenges of workforce aging in digital transformation by exploring the concept and influencing factors of older employees’ digital technology job insecurity within the digital context.

### Full Text

## Antecedents and Consequences of Digital Technology-Driven Job Insecurity Among Older Workers

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## Abstract

While digital transformation brings new opportunities for enterprise operations management, it also introduces a novel managerial challenge—the digital divide among older workers. Confronted with rapidly evolving and highly complex digital technologies, older workers commonly experience adaptation difficulties and may even fear being replaced by these technologies, leading to digital technology-driven job insecurity. This study focuses on this phenomenon, systematically exploring its triggering mechanisms and subsequent effects. Specifically, the research aims to: (1) clarify the conceptualization and dimensional structure of digital technology-driven job insecurity among older workers and develop corresponding measurement instruments; (2) examine how aging-related digital technology stereotypes, positive attitudes toward digital technology, and intrinsic motivation for digital technology learning affect older workers' digital technology-driven job insecurity, and investigate the moderating role of developmental human resource management practices based on person-context interaction theory; and (3) analyze the pathways through which digital technology-driven job insecurity influences older workers' behavior in their late career stages, as well as the boundary conditions of growth mindset and organizational digital support, grounded in motivational theory of life-span development.

By investigating the concept and influencing factors of digital technology-driven job insecurity among older workers in the digital era, this study provides theoretical support and practical guidance for addressing the challenges of workplace aging during digital transformation.

**Keywords:** job insecurity, older workers, digital technology

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## 1. Problem Statement

The digital era has created new opportunities for enterprise operations management while simultaneously generating a critical managerial challenge—the

digital divide among older workers (Hampel & Kunze, 2023). Due to declines in learning ability and cognitive processing speed (Salthouse, 2012), older workers often perceive insufficient adaptability to emerging digital technologies and feel that their experiential advantages are being displaced (Alcover et al., 2021). These perceptions threaten their sense of job continuity and stability, manifesting as digital technology-driven job insecurity. This phenomenon not only undermines older workers' physical and mental well-being but also negatively influences their work attitudes and behaviors (Alcover et al., 2021; Fasbender et al., 2023). Against the backdrop of China's delayed retirement policy and accelerated digital transformation, addressing digital technology-driven job insecurity among older workers has become an urgent priority for organizational development and management.

The conceptualization of digital technology-driven job insecurity among older workers reflects the dual interaction between age-related characteristics and technological features (Alcover et al., 2021). From an age perspective, factors such as reduced learning capacity and slower cognitive processing (Ebner et al., 2006; Taylor & Bisson, 2020; Truxillo et al., 2015) place older workers at a disadvantage in digital knowledge accumulation and skill updating (Alcover et al., 2021), intensifying their anxiety and concerns about job security (Soja & Soja, 2020). From a technological perspective, the experience-replacement effect of digital technologies—such as automated decision analysis and data interpretation—increases older workers' perceptions of being replaced (Granulo et al., 2019). Consequently, digital technology-driven job insecurity among older workers exhibits unique and complex conceptual dimensions.

The antecedents of this form of job insecurity are also distinctive. Traditional job insecurity research primarily attributes the phenomenon to external factors such as macroeconomic crises, organizational change, and work stress (Shoss, 2017). In contrast, digital technology-driven job insecurity among older workers stems more directly from the internal demands of digital transformation on skill adaptation and job redesign (Xie et al., 2023). Unlike younger employees who proactively enhance digital skills to cope with such insecurity, older workers typically exhibit lower learning willingness and more negative attitudes toward digital technology (Alcover et al., 2021; Hauk et al., 2018; Taylor & Bisson, 2020), which exacerbates their insecurity. Furthermore, in their late career stages, older workers experiencing digital technology-driven job insecurity tend to prioritize job stability and meaningfulness (Kooij et al., 2020), affecting their developmental and generativity motivations as well as their learning behaviors and intergenerational knowledge contribution. Therefore, this study investigates both the antecedents and underlying mechanisms of digital technology-driven job insecurity among older workers.

From the theoretical perspective of job insecurity, this study innovatively introduces the concept of “digital technology-driven job insecurity among older workers” to explore its multifaceted triggering mechanisms and consequences. The research unfolds across three dimensions: First, it clarifies the concept-

alization and dimensional structure of digital technology-driven job insecurity among older workers and develops a reliable and valid measurement instrument. Second, drawing on person-context interaction theory, it examines the interactive effects of aging-related digital technology stereotypes, positive attitudes toward digital technology, intrinsic motivation for digital technology learning, and developmental human resource management practices on older workers' digital technology-driven job insecurity. Third, grounded in motivational theory of life-span development, it investigates how digital technology-driven job insecurity influences older workers' behavioral outcomes in their late career stages and explores the moderating roles of growth mindset and organizational digital support. Practically, this study helps organizations effectively address the digital divide among older workers during digital transformation, providing theoretical foundations and practical guidance for strategic decision-making on workplace aging, thereby promoting intergenerational collaboration and sustainable organizational development.

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## 2. Literature Review

### 2.1 Digital Technology and Job Insecurity

Research on job insecurity dates back to the 1980s, when Greenhalgh and Rosenblatt (1984) defined the phenomenon as employees' concerns about job continuity arising from macroeconomic downturns. Subsequent research generally conceptualizes job insecurity as employees' perceived threats to and worries about current and future job continuity and stability (e.g., Shoss, 2017; Yam et al., 2022). With the deepening of digital transformation, scholars have increasingly focused on how digital technologies affect employees' job continuity and stability, particularly the threats posed by technological change, examining both antecedents and consequences.

Antecedent research in the digital technology context primarily examines technological characteristics and employees' technology awareness. Regarding technological features, digital technologies exhibit stronger substitution effects compared to traditional information technologies, intensifying job insecurity. For instance, Yam et al. (2022) found that robots with agency and physical presence more readily trigger job insecurity. Employees' digital technology awareness also constitutes a major factor (Zhou et al., 2024). He et al. (2023) discovered that employees' hindrance appraisals of artificial intelligence generate job insecurity, while AI knowledge as a key resource can effectively mitigate this effect. Consequence research reveals a double-edged sword effect. On the negative side, robot-induced job insecurity leads to abusive behavior, interpersonal deviance, and unethical conduct (Yam et al., 2022). On the positive side, Presbitero and Teng-Calleja (2023) found that employees who perceive digital technologies as job replacements experience job insecurity that promotes career exploration behavior. To reconcile these contradictory findings, scholars have differentiated

job insecurity dimensions. For example, Chen et al. (2022) found that quantitative job insecurity exhibits a U-shaped relationship with employees' vocational ability development, whereas qualitative job insecurity shows a positive correlation, revealing the complex mechanisms underlying job insecurity.

## 2.2 Digital Technology and Older Workers

As digital transformation accelerates and population aging intensifies, academic attention has turned to the multifaceted impacts of digital technology on older workers. Older workers in their late career stages generally prioritize preventing resource loss over maximizing resource gains (Ebner et al., 2006), with their abilities and motivations exhibiting age-related characteristics. For example, due to declines in learning and problem-solving abilities (Hampel & Kunze, 2023; Tams, 2022), older workers perceive technological threats when confronting emerging digital technologies (Alcover et al., 2021). Researchers have explained older workers' withdrawal behaviors and lower performance through lenses of digital vulnerability, insufficient digital literacy, and decreased cognitive processing speed (Alcover et al., 2021; Hampel & Kunze, 2023; Taylor & Bisson, 2020).

To address these challenges, scholars have proposed various interventions. Seberini et al. (2022) recommend increasing digital training programs, optimizing communication mechanisms, and building inclusive workplaces to mitigate the effects of the digital divide and technostress. Tams (2022) suggests enhancing older workers' digital technology experience and self-efficacy while simultaneously reducing their perceptions of digital overload and usage effort costs.

## 2.3 Review of Existing Research

Our literature review reveals that existing research has yet to establish a clear theoretical framework for digital technology-driven job insecurity among older workers. This study identifies three critical areas for deeper exploration.

First, current research inadequately addresses the intertwined realities of digital technology application and the older worker digital divide. Although studies acknowledge that older workers perceive threats and insecurity from digital technologies (Sheng et al., 2022), the field lacks a clear conceptual framework for digital technology-driven job insecurity among older workers, nor valid measurement instruments. This gap constrains research progress. Therefore, in the dual context of digital transformation and population aging, future research must reconceptualize the nature and characteristics of this phenomenon and develop psychometrically sound measures.

Second, while existing research recognizes the technological vulnerability and digital divide facing older workers during digital transformation, most studies remain at a single level of analysis, failing to examine interactions between individual and contextual factors. Digital technology impacts older workers particularly significantly (Alcover et al., 2021). For instance, Torres et al. (2019) note that age-related individual factors intensify older workers' perceptions of

technological threat. However, these studies explain the phenomenon solely from technological characteristics or employee awareness perspectives, neglecting multi-level influences (e.g., interactions between HR practices and older worker characteristics), which limits comprehensive understanding of the formation mechanisms. Research must therefore integrate individual and contextual factors to reveal their combined effects on digital technology-driven job insecurity among older workers.

Third, although research indicates that risk perceptions from digital technology affect older workers' job intentions, behaviors, and performance (Alcover et al., 2021), the underlying mechanisms remain underexplored. Age-related factors may produce unique responses to digital technology-driven job insecurity. For example, older workers tend to adopt avoidance and compensation strategies (Kooij & Van De Voorde, 2011), leading to diverse motivations and behaviors when coping with such insecurity. Future research must uncover the mechanisms generating these varied pathways and identify boundary conditions that influence differential responses, enabling organizations to develop targeted interventions that support older workers' adaptation and development during digital transformation.

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### 3. Research Framework

#### 3.1 Research Objectives and Framework

This study focuses on older workers (defined as employed individuals aged 40 and above) and introduces the core concept of “digital technology-driven job insecurity among older workers.” The research first explores its conceptualization and dimensional structure, then examines the interactive effects of individual characteristics and contextual factors on its formation mechanisms, and finally analyzes its influence pathways on older workers' late-career behaviors and relevant boundary conditions. Specific objectives include:

- (1) For digital technologies commonly adopted in modern workplaces, this study proposes the concept of digital technology-driven job insecurity among older workers. To deeply understand its essential characteristics, the research will integrate existing literature, analyze typical cases, conduct in-depth interviews, and follow standard scale development procedures to identify its conceptualization and dimensional features (digital technology adaptation insecurity and experiential advantage replacement insecurity).
- (2) Grounded in person-context interaction theory, this study investigates how aging-related digital technology stereotypes, positive attitudes toward digital technology, and intrinsic motivation for digital technology learning affect older workers' digital technology-driven job insecurity, and examines the moderating role of developmental human resource management

practices in these relationships, providing theoretical foundations for understanding the triggering mechanisms.

- (3) Based on motivational theory of life-span development, this study explores the mediating roles of older workers' development motivation and generativity motivation in the relationship between digital technology-driven job insecurity and late-career behaviors, and further investigates the moderating effects of growth mindset and organizational digital support in these differential pathways.

Based on these objectives, Figure 1 [Figure 1: see original paper] presents the overall research framework.

### 3.2 Research Module 1: Conceptualization, Structure, and Measurement

#### Figure 1. Overall Research Framework

Existing literature has extensively examined information technology-induced job insecurity (e.g., Ragu-Nathan et al., 2008; Tarafdar et al., 2007). However, digital technology differs fundamentally from traditional information technology. While information technology refers to using computers and communications for information collection, processing, storage, transmission, and retrieval, digital technology has expanded into emerging domains such as artificial intelligence (Baptista et al., 2020). Its rapid development is reshaping human-machine collaboration patterns in digital workplaces, creating more complex interactions. Consequently, previous conceptualizations cannot fully capture the unique nature of digital technology-driven job insecurity among older workers. Moreover, digital technology presents dual challenges: organizations demand that older workers continuously learn to adapt to technological changes (e.g., Fasbender et al., 2023; Marsh et al., 2022), potentially generating threats of replacement by younger employees or organizational obsolescence; simultaneously, digital automation may undermine older workers' experiential advantages (Granulo et al., 2019), eroding their perceived value as organizational veterans. Therefore, this study defines digital technology-driven job insecurity among older workers as the perceived threat to job continuity and stability arising from concerns about inability to adapt to rapidly evolving digital technologies and the potential replacement of experiential advantages.

Based on preliminary field research and extensive literature review, this study identifies two key dimensions of digital technology-driven job insecurity among older workers: learning ability and cognition. From a learning ability perspective, fluid intelligence naturally declines with age (Truxillo et al., 2015), resulting in longer learning curves and lower adaptation efficiency among older workers adopting digital technologies (Hampel & Kunze, 2023). As one older worker noted in an interview: "I can never remember how to operate these online office tools, and I keep making mistakes." Additionally, the rapid iteration of digital technologies prevents organizations from providing adequate learning and

adaptation periods for older workers (Anthony et al., 2023), leading to digital technology adaptation insecurity. From a cognitive perspective, older workers value self-actualization and experience transmission to fulfill social relationship and self-fulfillment needs (Kooij & Van De Voorde, 2011). However, digital technologies increasingly replace decision-making, experiential, and training tasks (Baptista et al., 2020). As another interviewee stated: “The company used to encourage learning from older workers’ experience, but now it promotes learning digital software from younger employees. These technologies are replacing my work experience.” This generates experiential advantage replacement insecurity. In summary, this study proposes two dimensions: digital technology adaptation insecurity (stemming from perceived capability gaps) and experiential advantage replacement insecurity (focusing on perceived erosion of experiential value).

Following classic scale development procedures (Hinkin, 1998) and building on existing job insecurity measures (Ashford et al., 1989; Hellgren et al., 1999), this study will develop a measurement instrument for digital technology-driven job insecurity among older workers. Through multiple survey rounds, expert feedback on item wording and content validity, and exploratory and confirmatory factor analyses, the scale will be refined and optimized. To ensure generalizability, the study will sample older workers from diverse industries and digital transformation contexts across multiple empirical tests to establish a psychometrically sound instrument.

### 3.3 Research Module 2: Triggering Mechanisms

Person-context interaction theory emphasizes that individuals and contexts do not exist in isolation but constitute an integrated, complex, and dynamic system. Within this system, individual cognition represents a dynamic, complex, and integrated process (Zeng & Sang, 2005), wherein interactions between individual and contextual factors better explain individual perceptions in complex social situations. Drawing on this theory, this study examines three core individual factors at the individual level—aging-related digital technology stereotypes, positive attitudes toward digital technology, and intrinsic motivation for digital technology learning—based on the work of Torres et al. (2019) and Venkatesh et al. (2003). The strength of these pathways depends on whether organizations implement HR practices that foster mutual organizational-employee development (i.e., developmental human resource management practices). The research model is presented in Figure 2 [Figure 2: see original paper].

#### Figure 2. Antecedent Model of Digital Technology-Driven Job Insecurity Among Older Workers

##### 3.3.1 Effects of Aging Characteristics, Motivation, and Attitudes

This study posits that aging-related digital technology stereotypes, positive attitudes toward digital technology, and intrinsic motivation for digital technology learning influence digital technology-driven job insecurity among older

workers. First, aging-related digital technology stereotypes, as cognitive biases, lead older workers to believe that physiological decline causes technological adaptation difficulties (Birkland, 2024; Mariano et al., 2022). This negative self-positioning as “technologically obsolete” undermines confidence in learning and adapting to digital technologies (Alcover et al., 2021; Mariano et al., 2022), increasing resistance to digital technologies and intensifying replacement threat perceptions, thereby exacerbating digital technology-driven job insecurity.

Second, attitudes, as key determinants guiding individual behavior, reflect integrated and consistent affective, cognitive, and behavioral orientations toward an object (Cabellos et al., 2024). From a positive psychology perspective, positive attitudes toward digital technology encourage older workers to actively seek digital resources and knowledge, facilitating integration into digital work environments (Cabellos et al., 2024). Such attitudes not only enhance digital capabilities but also effectively reduce digital technology-driven job insecurity.

Third, intrinsic motivation for digital technology learning refers to the internal drive to use digital technologies for work purposes (Venkatesh et al., 2003). This motivation encourages older workers to engage more frequently in digital activities, accumulating experience and skills that help maintain competitiveness in digital work, thereby reducing digital technology-driven job insecurity. Based on these arguments, we propose:

**Proposition 1a:** Aging-related digital technology stereotypes are positively related to digital technology-driven job insecurity among older workers.

**Proposition 1b:** Positive attitudes toward digital technology are negatively related to digital technology-driven job insecurity among older workers.

**Proposition 1c:** Intrinsic motivation for digital technology learning is negatively related to digital technology-driven job insecurity among older workers.

**3.3.2 Moderating Role of Developmental Human Resource Management Practices** Person-context interaction theory asserts that individuals and contexts constitute an integrated, complex, and dynamic system; examining either factor in isolation cannot fully explain individual perceptions (Zeng & Sang, 2005). Developmental human resource management practices view employees as organizational partners, promoting mutual development through four components: diversified training, developmental assessment, job design, and communication feedback (Tang et al., 2021). This study proposes that developmental HR practices moderate the relationships between the three individual factors and digital technology-driven job insecurity.

First, older workers holding aging-related digital technology stereotypes often lack confidence in using and learning digital technologies (Alcover et al., 2021; Birkland, 2024). Developmental HR practices can reduce their insecurity by providing continuous diversified digital skills training and developmental assessment (Tang et al., 2021), enabling greater exposure to digital technologies and

facilitating late-career planning (Zaleska & de Menezes, 2007).

Second, for older workers with positive attitudes toward digital technology, developmental HR practices can further reduce insecurity through systematic feedback and communication mechanisms that recognize and support these attitudes, complemented by customized training programs (Tang et al., 2021).

Third, for older workers with high intrinsic motivation for digital technology learning, developmental HR practices can address their developmental needs and enhance technological adaptability through flexible work arrangements and tailored support (Tang et al., 2021). By providing job autonomy, designing challenging tasks, and offering digital work support, these practices help motivated older workers reduce their digital technology-driven job insecurity. Therefore, we propose:

**Proposition 2a:** Developmental human resource management practices moderate the positive relationship between aging-related digital technology stereotypes and digital technology-driven job insecurity, such that the relationship is weaker (stronger) under high (low) levels of developmental HR practices.

**Proposition 2b:** Developmental human resource management practices moderate the negative relationship between positive attitudes toward digital technology and digital technology-driven job insecurity, such that the relationship is stronger (weaker) under high (low) levels of developmental HR practices.

**Proposition 2c:** Developmental human resource management practices moderate the negative relationship between intrinsic motivation for digital technology learning and digital technology-driven job insecurity, such that the relationship is stronger (weaker) under high (low) levels of developmental HR practices.

### 3.4 Research Module 3: Consequences

Motivational theory of life-span development posits that individuals continuously prioritize their agency throughout the lifespan, with the pursuit of control representing a core psychological need (Heckhausen et al., 2019). As individuals age, they experience diminishing gains and increasing losses (Baltes, 1997). Constrained by abilities and energy, older workers tend to avoid or minimize the negative effects of aging while maximizing potential positive outcomes (Baltes & Baltes, 1990), which influences their motivations. This study argues that older workers experiencing digital technology-driven job insecurity will invest more time and effort in preventing potential losses (e.g., by sharing experience) rather than pursuing challenging work for personal growth (e.g., actively learning digital technologies), thereby affecting their development and generativity motivations and subsequently influencing their late-career performance. The strength of these effects depends on older workers' growth mindset and organizational digital support. The research model is presented in Figure 3 [Figure 3: see original paper].

**Figure 3. Consequence Model of Digital Technology-Driven Job Insecurity Among Older Workers**

**3.4.1 Effects on Development Motivation and Generativity Motivation** Development motivation refers to the drive to pursue better developmental opportunities and work outcomes (Kooij & van de Voorde, 2011). Motivational theory of life-span development indicates that individuals' sense of control over future development affects their motivation (Shane & Heckhausen, 2019), and this sense of control declines with age. Older workers experiencing digital technology-driven job insecurity feel unable to adapt to emerging digital technologies and worry about replacement, which intensifies pessimistic expectations about personal development opportunities (Heckhausen & Schulz, 1995) and reduces development motivation. Additionally, when individuals perceive goals as unattainable, they adopt self-protection strategies (Shane & Heckhausen, 2019). For older workers, digital technology-driven job insecurity triggers self-protection strategies that focus on maintaining the status quo and preventing resource loss (Baltes & Baltes, 1990), further diminishing development motivation.

Generativity motivation refers to the drive to support and guide younger generations and contribute to their development (McAdams & de St Aubin, 1992). The prevalence of multi-generational workplaces has assigned older workers greater knowledge transmission responsibilities (Wang & Zuo, 2018), and Chinese cultural traditions emphasizing intergenerational mentorship (Cui, 2024) have led organizations to implement "master-apprentice" systems (Gao & Xu, 2024; Ye et al., 2020). Motivational theory of life-span development suggests that reduced goal opportunities prompt individuals to disengage from current goals and pursue new ones (Heckhausen et al., 2019; Shane & Heckhausen, 2019). Digital technology-driven job insecurity may thus shift older workers toward seeking mentorship roles to maintain a sense of control. Research indicates that individuals in mid-to-late life stages often exhibit adaptive responses to threats, with generativity being a key manifestation (Erikson, 1963). This study therefore proposes that digital technology-driven job insecurity enhances generativity motivation. Specifically, such insecurity creates concerns about the future and value loss (Rothschild et al., 2011), while also prompting reflection on the value and meaning of being a "veteran employee" (Cunningham & Sweet, 2009). These processes facilitate adaptive responses that enhance generativity motivation. We propose:

**Proposition 3a:** Digital technology-driven job insecurity is negatively related to development motivation among older workers.

**Proposition 3b:** Digital technology-driven job insecurity is positively related to generativity motivation among older workers.

**3.4.2 Effects of Motivations on Behavior** Regarding development motivation, older workers with high development motivation tend to invest more energy

and time in work to continue making contributions, which stimulates digital technology learning behaviors. Development motivation encourages continuous learning and education to maintain and enhance capabilities, satisfying needs for self-determination and skill utilization (van Woerkom et al., 2023), thereby increasing digital technology learning behaviors. Additionally, development-motivated older workers focus on job responsibilities and seek control over their work (Stamov-Roßnagel & Hertel, 2010), which enhances initiative and proactivity in learning digital technology-related knowledge.

Regarding generativity motivation, older workers with high generativity motivation dedicate more effort to contributing to the organization during their remaining career. This motivation encourages them to actively transmit accumulated work experience and knowledge to younger colleagues, alerting them to critical work issues (Cunningham & Sweet, 2009; Song et al., 2023)—that is, engaging in intergenerational knowledge contribution behavior. We propose:

**Proposition 4a:** Development motivation is positively related to digital technology learning behavior among older workers.

**Proposition 4b:** Generativity motivation is positively related to intergenerational knowledge contribution behavior among older workers.

Based on Propositions 3a and 4a, and 3b and 4b, we further propose that digital technology-driven job insecurity influences digital technology learning behavior through development motivation and intergenerational knowledge contribution behavior through generativity motivation:

**Proposition 5a:** Development motivation mediates the relationship between digital technology-driven job insecurity and digital technology learning behavior, such that digital technology-driven job insecurity has a negative indirect effect on digital technology learning behavior through development motivation.

**Proposition 5b:** Generativity motivation mediates the relationship between digital technology-driven job insecurity and intergenerational knowledge contribution behavior, such that digital technology-driven job insecurity has a positive indirect effect on intergenerational knowledge contribution behavior through generativity motivation.

**3.4.3 Moderating Role of Growth Mindset** Growth mindset represents a positive individual mindset pattern in which individuals believe abilities can be developed through effort and learning (Hui & Rabinovich, 2021; Yeager & Dweck, 2020). This mindset can help older workers actively confront digital technology challenges. This study proposes that growth mindset weakens the negative relationship between digital technology-driven job insecurity and development motivation. First, individuals with growth mindset view setbacks as learning opportunities (Keating & Heslin, 2015). When experiencing digital technology-driven job insecurity, these older workers are more likely to perceive digital threats as opportunities for self-improvement, thereby enhancing

development motivation. Second, growth-minded individuals focus on learning processes rather than just outcomes (Hui & Rabinovich, 2021). When facing digital technology-driven job insecurity, they concentrate more on acquiring new knowledge and improving capabilities, reducing the negative impact on development motivation.

Additionally, growth mindset strengthens the positive relationship between digital technology-driven job insecurity and generativity motivation. Growth-minded individuals tend to engage in interpersonal interactions by helping others (Keating & Heslin, 2015). When confronting digital technology-driven job insecurity, these older workers avoid self-protective withdrawal and instead transform potential threats into proactive strategies of knowledge transmission to promote intergenerational interaction (Song et al., 2023), achieving career meaning reconstruction and continuous growth through mentoring younger generations. Therefore, we propose:

**Proposition 6a:** Growth mindset moderates the relationship between digital technology-driven job insecurity and development motivation, such that the negative relationship is weaker (stronger) when growth mindset is high (low).

**Proposition 6b:** Growth mindset moderates the relationship between digital technology-driven job insecurity and generativity motivation, such that the positive relationship is stronger (weaker) when growth mindset is high (low).

Based on Propositions 5a and 5b, we further propose:

**Proposition 7a:** Growth mindset moderates the indirect effect of digital technology-driven job insecurity on digital technology learning behavior through development motivation, such that the negative indirect effect is weaker (stronger) when growth mindset is high (low).

**Proposition 7b:** Growth mindset moderates the indirect effect of digital technology-driven job insecurity on intergenerational knowledge contribution behavior through generativity motivation, such that the positive indirect effect is stronger (weaker) when growth mindset is high (low).

**3.4.4 Moderating Role of Organizational Digital Support** Organizational digital support refers to establishing dedicated digital departments with specialized personnel who provide systematic pre-implementation training, help employees learn and master new digital technologies, and promptly resolve technical difficulties encountered in daily work (Marsh et al., 2022). When older workers experiencing digital technology-driven job insecurity receive high levels of organizational digital support, they can more smoothly learn and use digital equipment, with technical problems resolved in a timely manner (Hampel & Kunze, 2023). This enhances their sense of capability and confidence in handling digital work, thereby strengthening both development and generativity motivations. We propose:

**Proposition 8a:** Organizational digital support moderates the relationship

between digital technology-driven job insecurity and development motivation, such that the negative relationship is weaker (stronger) under high (low) organizational digital support.

**Proposition 8b:** Organizational digital support moderates the relationship between digital technology-driven job insecurity and generativity motivation, such that the positive relationship is stronger (weaker) under high (low) organizational digital support.

Based on Propositions 5a and 5b, we further propose:

**Proposition 9a:** Organizational digital support moderates the indirect effect of digital technology-driven job insecurity on digital technology learning behavior through development motivation, such that the negative indirect effect is weaker (stronger) under high (low) organizational digital support.

**Proposition 9b:** Organizational digital support moderates the indirect effect of digital technology-driven job insecurity on intergenerational knowledge contribution behavior through generativity motivation, such that the positive indirect effect is stronger (weaker) under high (low) organizational digital support.

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## 4. Theoretical Contributions

This study centers on digital technology-driven job insecurity among older workers, investigating its antecedents and consequences after clarifying its conceptualization and structural characteristics, thereby offering both theoretical and practical contributions.

### 4.1 Theoretical Significance

First, this study theoretically introduces the concept of digital technology-driven job insecurity among older workers and explores its unique dimensional structure, addressing the insufficient attention to both older worker populations and technology-specific job insecurity in existing literature. On one hand, this concept differs from traditional job insecurity, yet the literature lacks precise definitions. On the other hand, given digital technologies' rapid iteration, complexity, and experience-replacement features, older workers face both adaptation challenges and replacement threats, suggesting a multidimensional structure. By proposing this concept and developing measurement tools, this study enriches scholarly understanding and provides new perspectives and instruments for job insecurity research.

Second, this study enriches research on older workers in digital contexts and addresses the limited attention to older workers' perceptions in digital transformation research. As digital transformation deepens, older workers require digital competencies (e.g., digital literacy) to secure high income and benefits and overcome age discrimination (Lissitsa et al., 2017). However, older workers

generally struggle with digital challenges, with existing research attributing this to insufficient digital literacy and declining cognitive abilities (Hampel & Kunze, 2023; Taylor & Bisson, 2020). By focusing on digital technology-driven job insecurity, this study not only expands older worker research in digital contexts but also provides a new explanatory perspective for understanding their challenges.

Third, drawing on person-context interaction theory, this study comprehensively reveals the antecedents of digital technology-driven job insecurity from dual individual and contextual perspectives, enriching theoretical understanding of its triggering mechanisms. Previous research has examined individual factors (e.g., technostress, self-efficacy) and organizational factors (e.g., training programs, inclusive workplaces) affecting traditional job insecurity and older workers' cognition and behavior (e.g., Hampel & Kunze, 2023; Jiang et al., 2021; Tams, 2022). However, these studies overlook the unique digital transformation context and the interactive effects between older workers' aging characteristics and contextual features. This study addresses this gap by examining aging-related digital technology stereotypes, positive attitudes, intrinsic motivation, and developmental HR practices, enabling deeper and more comprehensive understanding of the phenomenon's antecedents.

Fourth, based on motivational theory of life-span development, this study examines the differential effects of digital technology-driven job insecurity on older workers' late-career motivations and behaviors, enriching research on the diverse behavioral outcomes of this insecurity. While scholars have explored how digital transformation-induced job insecurity affects performance (e.g., Chen et al., 2022; Yam et al., 2022), older workers may exhibit varied and complex responses (Shane & Heckhausen, 2019). Specifically, late-career older workers tend to minimize aging's negative effects while maximizing positive outcomes (Baltes & Baltes, 1990), generating diverse motivations (development and generativity) that drive different behaviors. This study investigates these differential pathways and their boundary conditions, clarifying the consequences of digital technology-driven job insecurity among older workers.

## 4.2 Practical Significance

First, digital transformation has become a strategic imperative for traditional enterprises seeking competitive advantage in the digital economy. However, organizations face numerous challenges, including high digital learning costs and rapid technological iteration. This study deeply examines the challenges and dilemmas of managing older workers during digital transformation, analyzing their multiple challenges from the perspective of digital technology-driven job insecurity. These insights provide valuable guidance for organizational management, facilitating sustainable development and older workers' career success.

Second, managers must recognize that successful digital transformation requires not only technological adoption but also synchronized changes in management practices, particularly HR practices, to help older workers with "digital divides"

and “technological vulnerability” understand and adapt to digital transformation. Specifically: (1) Managers should provide clear late-career planning and targeted digital skills training to help older workers navigate the dual challenges of digitalization and aging. (2) Organizations should establish appropriate “generativity” systems and foster harmonious intergenerational climates to encourage older workers to leverage their strengths and pursue self-worth.

Finally, for older workers themselves, successfully addressing digital challenges hinges on enhancing self-awareness and knowledge reserves. Whether older workers can effectively manage digital technology-driven job insecurity, continue contributing value, grow with the organization, and avoid replacement or marginalization depends not only on organizational policies and HR interventions but also critically on their own cognitive levels and knowledge bases. Therefore, older workers must adopt proactive attitudes, continuously learn new knowledge and skills, and enhance their adaptability in the digital era to meet emerging challenges.

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