



The Impact of STARA Awareness on Employee Career Crafting

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Abstract. The rise of smart technology, artificial intelligence, robotics, and algorithms (STARA) signifies a systemic shift in the nature of work, skill requirements, and human-technology collaboration, exerting a profound impact individuals' career trajectories and sense of security. In this context, how employees cope with uncertainty through proactive career crafting becomes critical for their sustainable career development. Grounded in Conservation of Resources (COR) theory, this study investigates the mechanism by which employees' STARA awareness influences their career crafting. Analysis of survey data from 312 employees demonstrates that STARA challenge awareness positively affects career crafting, whereas STARA hindrance awareness negatively affects it. These findings not only reveal the differentiated paths through which STARA awareness influences career crafting via distinct resource management motives, but also provide important theoretical foundations and managerial insights for organizations seeking to guide employees in actively adapting to technological changes and achieving human-technology synergy.

Keywords: STARA Challenge Awareness, STARA Hindrance Awareness, Career Crafting

1 Introduction

According to the World Economic Forum's Future of Jobs Report (2023), the wave of intelligent technologies represented by smart technology, artificial intelligence, robotics, and algorithms (STARA) is projected to substantially reshape global employment structures within the next five years. Not only will tens of millions of jobs be disrupted and a large number of new roles emerge, but nearly one-quarter of all jobs will undergo qualitative changes due to automation, requiring over 60% of workers to update their skills. This shift transcends mere task-level automation, signaling a systemic reconfiguration of job content, requisite skill sets, and modes of human-technology collaboration, thereby exerting a fundamental impact on individuals' career trajectories. In this context, pursuing STARA-centric digital intelligence transformation has evolved from a strategic option into an operational imperative for organizations aiming to sustain competitiveness. For individual workers, proactively

planning and managing this pervasive and uncertain career change has become a critical challenge directly affecting their career resilience and long-term professional sustainability.

Facing the career challenges posed by systemic restructuring, employees are the ultimate agents of change, making their proactive adaptation essential. In this context, career crafting, which refers to individuals' self-initiated, boundary-spanning, and continuous self-management behavior aimed at proactively aligning their career aspirations with the external career environment, represents a critical adaptive pathway. However, whether and how employees engage in career crafting are fundamentally influenced by their subjective perceptions and appraisal of the driver of change, STARA. These perceptions and appraisal are conceptualized as STARA awareness.

The transition from cognitive appraisal to proactive career crafting can be better understood through Conservation of Resources (COR) theory. This framework accommodates the dual perceptions of hindrance and challenge, linking them directly to resource management motivations and subsequent behavioral strategies. Therefore, grounded in COR theory, this study examines how different dimensions of employees' STARA awareness influence career crafting through the distinct motivational pathways of resource acquisition and resource conservation. By clarifying these mechanisms, the research seeks to provide organizations with evidence-based, actionable insights for designing targeted interventions and fostering supportive environments in the STARA era, ultimately helping to shift employees from passive job adaptation toward proactive career co-creation.

2 Theoretical Analysis and Research Hypothesis

As the intelligent transformation of the workplace continues to deepen, the widespread adoption of STARA is reshaping the professional landscape and having a profound impact on employees' psychology and behavior. Against this backdrop, STARA awareness has become established as a key construct receiving sustained scholarly attention. STARA awareness was initially defined as employees' perception that STARA technologies might replace their jobs in the future. Much of the relevant research has focused on its negative consequences, such as decreased organizational commitment, increased turnover intentions, and symptoms of depression and cynicism^[1]. However, subsequent studies have pointed out that viewing STARA awareness solely as a perception of threat has theoretical limitations. Based on the Cognitive Appraisal Theory of Stress, employees may evaluate the same stressor differently^[2]. Accordingly, Ding (2021)^[3] pioneered the proposition that STARA awareness possesses dual attributes. Employees may evaluate it as a threat that hinders career development or as a challenge that offers growth opportunities. This two-dimensional perspective has been further expanded and supported in subsequent research. Consequently, the academic community now widely agrees that STARA awareness is a two-dimensional construct comprising both STARA challenge awareness and STARA hindrance awareness, providing a more refined theoretical analytical framework for

understanding the complex psychological responses of employees facing technological disruption.

Tims and Akkermans (2020) ^[4] were the first to derive the concept of career crafting from the theory of job crafting, defining it as goal-oriented, self-directed career management behaviors that individuals proactively adopt to achieve optimal person-job fit. They further categorized it into two dimensions: proactive career reflection and proactive career construction. Proactive career reflection entails a deep cognitive examination of one's career motivations, values, and goals. Driven by intrinsic growth needs, individuals clarify what work means to them. Proactive career construction refers to future-oriented behaviors in which individuals implement structural adjustments and expansions of work tasks, skill sets, social relationships, and cognitive frameworks to achieve career goals.

When employees appraise STARA as a challenge, they perceive an opportunity for resource gain. According to COR theory, this fuels a motivation to invest in new resources, thereby enhancing long-term adaptability. First, to seize this opportunity, employees systematically assess their own resources and plan for the future, actively establishing a psychological connection with a more competitive future self, thereby clarifying the direction for their development and adjustment ^[5]. At the same time, STARA challenge awareness itself satisfies employees' basic psychological needs such as autonomy and a sense of competence ^[6]. The fulfillment of these needs serves as a key psychological resource, providing the cognitive and emotional foundation for in-depth career reflection. Ultimately, to transform opportunities into sustained career competitiveness, employees proactively invest their existing resources such as time and energy into concrete actions to alter their career paths. For example, they may optimize work content and relationships through facilitative job crafting, thereby driving work innovation and enhancing personal efficacy ^[7].

In contrast, STARA hindrance awareness is essentially the perception of potential loss of critical career resources. This intense threat of resource loss immediately triggers an individual's resource protection and defensive motivations, thereby systematically inhibiting the proactive resource investment required for career crafting. STARA hindrance awareness first induces anxiety and insecurity, continuously depleting employees' psychological and cognitive resources ^[1], trapping them in worries and ruminations about potential losses rather than engaging in constructive proactive career reflection. This severely impairs their cognitive ability to plan for the future and connect with their future professional selves. Second, driven by defensive motivations and seeking to avoid further risks, employees tend to adopt conservative strategies, reducing proactive changes that might introduce uncertainty, thereby directly inhibiting proactive career construction. Empirical research demonstrates that hindrance awareness hinders employees' ability to craft their careers ^[7] and may lead them to reduce knowledge sharing and innovative attempts in order to protect themselves ^[8].

Conservation of Resources theory serves as the core explanatory framework for this study. The theory posits that individuals are fundamentally motivated to retain and acquire valuable resources. Perceptions of potential resource loss trigger stress and defensive behaviors, whereas appraisals of potential resource gain can motivate

proactive investment^[9]. Within the context of this research, an employee's STARA awareness constitutes a critical appraisal of the resource changes precipitated by STARA technology. Specifically, STARA challenge awareness reflects an appraisal that STARA presents opportunities for resource gain. This is expected to foster a proactive resource investment strategy, motivating employees to engage in career crafting through deep active career reflection and proactive career construction. In contrast, STARA hindrance awareness reflects an appraisal that STARA poses a threat of resource loss. According to the theory, this should directly evoke a defensive mindset aimed at conserving remaining resources, thereby inhibiting career crafting behaviors that require additional resource investment. Accordingly, this study proposes the following hypotheses:

Hypothesis 1: STARA challenge awareness positively influences career crafting.

Hypothesis 2: STARA hindrance awareness negatively influences career crafting.

In summary, the theoretical model of this study is depicted in Figure 1.

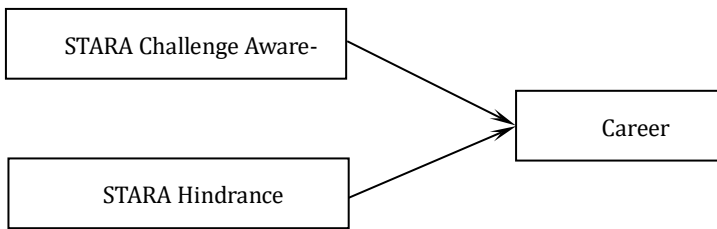


Fig. 1. Research model

3 Method

3.1 Sample

Survey data were collected from employees through the online platform Wenjuanxing.com. Participants were assured in the questionnaire instructions that their responses would be used for academic purposes only. A total of 360 questionnaires were distributed, resulting in 337 returned. After removing responses with missing data, 312 valid questionnaires were retained, yielding an effective response rate of 86.67%. The final sample consisted of 159 males (50.96%) and 153 females (49.04%). In terms of age distribution, participants aged 31–40 years formed the largest group (42.63%, $n = 133$). Regarding education level, the majority held a bachelor's degree (60.58%, $n = 189$). With respect to tenure, those with less than one year of employment constituted the largest group (26.60%, $n = 83$).

3.2 Measures

All variables were measured using established scales on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

(1) STARA challenge awareness: This study employed the four-item challenge dimension of the STARA Challenge-Hindrane Awareness Assessment Scale developed by Ding (2021) [3]. A sample item is: "The job uncertainty generated from STARA will help me to learn a lot." The Cronbach's α for this scale was 0.921.

(2) STARA hindrance awareness: This study employed the four-item hindrance dimension from the same scale by Ding (2021) [3]. A sample item is: "The job uncertainty generated from STARA will hinder any achievements I might have." The Cronbach's α for this scale was 0.900.

(3) Career crafting: This study employed the 8-item scale developed by Tims and Akkermans (2020) [4], which assesses two dimensions: proactive career reflection and proactive career construction. Sample items for each dimension are "I assess for myself what I really value in my career" (proactive career reflection) and "I deliberately show others what I am good at" (proactive career construction). The Cronbach's α for this scale was 0.938.

(4) Control variables: Demographic variables, specifically gender, age, education level, and tenure, were included as controls in the analysis to account for their potential influence.

4 Results

4.1 Common Method Bias Testing

Because all variables in this study were measured using the same self-report questionnaire, the data may be susceptible to common method bias. To examine this issue, Harman's single-factor test was conducted using unrotated principal component analysis on all measurement items. The results revealed three factors with eigenvalues greater than 1, and the first unrotated factor accounted for 39.302% of the variance, which is below the recommended threshold of 40%. Furthermore, the rotated component matrix clearly distinguished three factors, with all items loading above 0.79 on their respective intended factors, and no single factor explained the majority of the variance. Therefore, common method bias does not pose a serious problem in this study and is unlikely to substantially interfere with the testing of subsequent hypotheses.

4.2 Correlation Analysis

Table 1 presents the means, standard deviations, and correlations among the key variables. As shown, STARA challenge awareness was significantly and positively correlated with career crafting ($r = 0.255$, $p < 0.001$), whereas STARA hindrance awareness was significantly and negatively correlated with career crafting ($r = -0.182$, $p < 0.001$). These correlation results provide initial support for our hypotheses.

Table 1. Results of descriptive statistics and correlation coefficients

Variables	Mean Value	Standard deviation							
			1	2	3	4	5	6	7
1.Gender	1.490	0.501	1						
2.Age	2.513	0.833	0.074	1					
3.Education level	1.862	0.614	0.011	0.038	1				
4.tenure	2.718	1.390	-0.050	0.017	0.011	1			
5.STARA challenge awareness	3.392	1.138	0.095	0.026	0.068	-0.050	1		
6.STARA hindrance awareness	2.660	1.143	0.046	0.059	0.001	0.051	-0.173**	1	
7.Career crafting	3.303	1.033	0.115*	0.010	0.090	-0.076	0.255***	-0.182***	1

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3 Hypothesis Testing

To investigate the predictive roles of STARA challenge awareness and STARA hindrance awareness in career crafting, a hierarchical regression analysis was conducted. The regression results are presented in Table 2. After controlling for gender, age, education level, and tenure, STARA challenge awareness was found to have a significant positive effect on career crafting ($\beta = 0.193$, $p < 0.001$), while STARA hindrance awareness had a significant negative effect on career crafting ($\beta = -0.133$, $p < 0.01$). The combined model accounted for 10.3% of the variance ($R^2 = 0.103$, $F = 5.850$, $p < 0.001$). Therefore, both Hypothesis 1 and Hypothesis 2 were supported.

Table 2. Results of regression analysis

Variables	Career crafting			
	M1	M2	M3	M4
Gender	0.228	0.184	0.245	0.202
Age	0.000	-0.005	0.013	0.006
Education level	0.150	0.123	0.149	0.125
tenure	-0.053	-0.045	-0.046	-0.040
STARA challenge awareness		0.217***		0.193***
STARA hindrance awareness			-0.167***	-0.133**
R^2	0.026	0.082	0.060	0.103
ΔR^2	0.026	0.056	0.060	0.021
F	2.064	5.487	3.924	5.850

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5 Conclusions

Based on the Conservation of Resources theory, this study establishes a research logic and theoretical framework centered on “STARA awareness – career crafting.” The results indicate that STARA challenge awareness significantly and positively influences career crafting, whereas STARA hindrance awareness exerts a significant negative impact on it. Theoretically, this study validates and extends the applicability of Conservation of Resources theory within the new context of digital and intelligent transformation. Furthermore, it empirically reveals the multiple dimensions of STARA awareness and their differential impacts, thereby moving beyond the conventional unidimensional perception of STARA and providing a more nuanced framework for understanding human-STARA interaction.

In practical terms, this study offers important insights for organizations seeking to effectively guide employees through career crafting in the STARA era. Managers should establish a comprehensive pathway that spans from systematic assessment to targeted support. First, through surveys and evaluations, they should identify employees' varying attitudes toward STARA technologies and precisely distinguish between employee groups that view technological change as a challenge versus those who perceive it as a threat. This diagnostic process should be systematized and institutionalized and can be integrated into regular organizational climate assessments. Tracking measurements using standardized STARA awareness scales or focus group interviews can provide ongoing insights into the cognitive differences among various employee groups. Only by establishing such a systematic cognitive assessment mechanism can subsequent management interventions be grounded in precise empirical evidence. Building on this foundation, organizations should formally recognize and encourage career crafting as a key professional competency, integrating it into strategic talent development frameworks. In performance management, organizations should increase the evaluation and incentives for employees' deep reflection, proactive career planning, skill updating, and internal networking. At the same time, specialized support programs can be designed to provide employees with the time and resources needed to explore new internal roles and participate in cross-departmental projects, thereby deeply aligning the organization's digital and intelligent transformation with employees' career development.

6 Limitations and Future Research Directions

Although this study has generated valuable insights, several limitations should be acknowledged. First, the data were collected through an online questionnaire platform without setting screening criteria regarding the industry type of respondents or the specific stage of STARA technology application. While this sampling approach provides a broad overview of employee perceptions across diverse contexts, it limits our ability to test industry-specific boundary conditions. Consequently, the generalizability of the findings to specific organizational settings remains an open question for future research. Future research could deepen understanding by focusing on particular

industries or controlling for contextual variables. Second, the current investigation focused primarily on the direct relationships between STARA awareness and career crafting. However, the underlying psychological mechanisms that translate cognitive perceptions into proactive behaviors are inherently more complex. Future work could extend this research by incorporating additional constructs to elucidate the mediating mechanisms and boundary conditions that characterize the relationship between STARA awareness and career crafting.

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