



Helping hand or hindering hand? Matching cognitive styles with intelligent assistants influences hospitality employees' work well-being

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How to cite: Liu, F., Wang, H., & Yan, S. (2025). Helping hand or hindering hand? Matching cognitive styles with intelligent assistants influences hospitality employees' work well-being. *Social Behavior and Personality: An international journal*, 53(9), e14580

With the rapid development of digital intelligence technology, intelligent assistants have become a key technology driving social progress and affecting various industries, including hospitality. This study used the job demands–resources model as the basis of three progressive experiments ($N = 150, 202$, and 314 , respectively) to explore the impact of the degree of cognitive style matching between intelligent assistants and hospitality employees on work well-being and its underlying mechanisms. The findings indicated that employees with both adaptor and innovator cognitive styles perceived greater work well-being when the cognitive style of the intelligent assistant matched (vs. mismatched) theirs; moreover, cognitive dissonance and work energy played mediating roles in the aforementioned relationships. Our results enrich the literature on intelligent assistants in the hospitality industry from a management perspective and provide practical references for hospitality managers to effectively use intelligent assistants and guide employee management.

Keywords

intelligent assistant, cognitive style, employee work well-being, cognitive dissonance, work energy

Article Highlights

- This research identified the role of cognitive style matching between humans and digital assistants in influencing employees' work well-being, providing a new perspective for hospitality managers to create personalized artificial intelligence assistants.
- We extended the job demands–resources model and identified cognitive dissonance and work energy as two important psychological factors that affect work well-being.
- Our findings have significance for hospitality managers to flexibly utilize artificial intelligence to enhance employees' work well-being.

With the global economy entering the fourth industrial revolution, generative artificial intelligence (AI) is driving significant technological change in the hospitality sector (Bankins et al., 2024). This revolution has led to the development of advanced hospitality intelligent assistants, such as JINTELL by Jin Jiang Group, Xiao Xi by Hilton Group, and Shang Xiaomei by Shangmei Life Group. These advanced systems, which are designed to appear more intelligent and human-like than their basic counterparts, have an impact on employees' psychological well-being (Chowdhury et al., 2023). On one hand, they can assist employees in completing work tasks by imitating human cognitive styles, greatly enhancing employee work efficiency and work experience (Huang & Gursoy, 2024; Yin et al., 2024). Conversely, when their performance falls short of employee expectations, it can lead to negative cognitive

assessments, ultimately diminishing employees' psychological health (Malik et al., 2022; Robert et al., 2020). The influence of intelligent assistants on employee psychological health is thus a double-edged sword (Q. Wang et al., 2024). Employees in hospitality can face more psychological health challenges than those in other sectors (Xiong et al., 2023). Work well-being, characterized by positive evaluations and enjoyable experiences at work (Fisher, 2010), is crucial for mental health. Consequently, establishing a positive collaboration between employees and intelligent assistants to enhance perceived work well-being is a shared concern in both academia and practice. X. Liu and Xie (2024) found that collaborative AI boosts work well-being, while competitive AI has negative effects. Y.-C. Wang et al. (2024) noted that the appealing design and empathetic capabilities of intelligent assistants significantly influence employees' psychological safety and usage intentions, with psychological safety being essential for work well-being. Although these studies offer insights into the relationship between intelligent assistants and work well-being, further exploration is needed of the social attributes of technology.

The social attributes of technology emphasize the pivotal role of employees in human–AI interaction (X. Liu & Xie, 2024), with trait matching between employees and AI significantly affecting user experiences. Intelligent assistants can provide timely, accurate feedback tailored to user needs and adapted to users' cognitive styles, facilitating interactions that align with their thinking habits. M. M. Wang et al. (2023) found that alignment between leaders' and employees' cognitive styles enhances organizational trust and citizenship behavior. Similarly, Rahwan et al. (2019) argued for a human-centered approach in shaping the cognitive style AI is trained to display. However, empirical support for this view is limited. Adaptor and innovator cognitive styles are independent yet interdependent, influencing employees' evaluations of work (Chakraborty et al., 2008). The job demands–resources (JD–R) model (Demerouti et al., 2001) categorizes work matters into *job demands*, which can impair health, and *job resources*, which promote health. A mismatch between the cognitive styles of intelligent assistants and employees can disrupt cognitive balance, reducing well-being, while a match can enhance work energy and well-being. This study investigated the effect of cognitive style matching between intelligent assistants and employees on work happiness and its underlying mechanisms (see Figure 1).

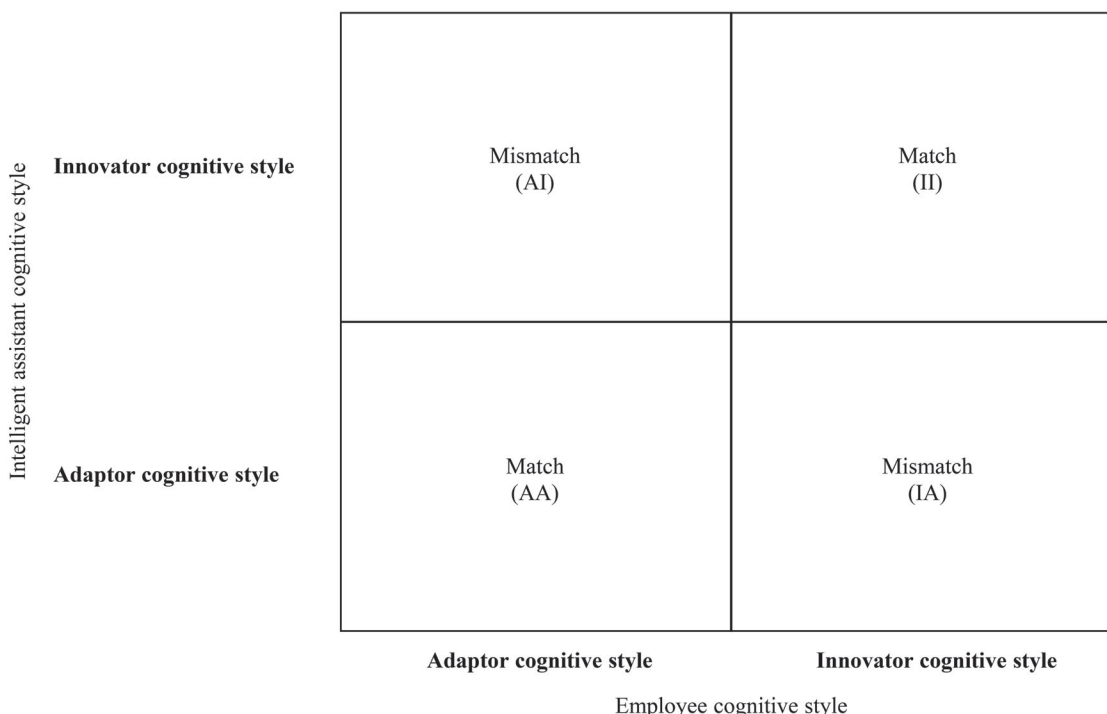


Figure 1. *Model of Cognitive Style Matching*

Intelligent Assistants

In hospitality settings, *intelligent assistants* enhance customer experience and operational efficiency, acting as chatbots for real-time engagement (e.g., managing bookings, offering housekeeping service, and providing travel advice) while utilizing data analytics for personalized service. Previous research has indicated that intelligent assistants affect consumer well-being (Zhang et al., 2024). High-quality hotels are integrating intelligent assistants into the employee workflow to boost productivity and service quality (Cooke et al., 2019). However, empirical studies on the relationship between intelligent assistants and hospitality employees are relatively scarce.

Cognitive Style

Cognitive style denotes an individual's habitual patterns in perception, memory, thinking, and problem solving (Tierney et al., 1999), and is relatively stable (H. Liu et al., 2021). Scholars have systematically classified cognitive styles across various dimensions. For instance, Kirton (1976) identified adaptor and innovator types, while Witkin et al. (1977) distinguished between field-independent and field-dependent styles based on environmental reliance. The rapid advancement of AI technology has enabled the development of AI systems designed to embody similar cognitive styles tailored to user needs and behaviors. Currently, the primary goal of introducing AI in many industries, including the hospitality industry, is to enhance employee innovation capabilities and corporate profits, rather than employee well-being (Malik et al., 2022). It is worth noting that service innovation in the hospitality industry does not always require the creation of unprecedented service models. It can also involve learning from other hotel groups to provide experiences for guests that differ from existing services (H. Xu et al., 2017). *Adaptor styles* focus on enhancing established experiences through established procedures, whereas *innovator styles* promote novel strategies to overcome challenges (Kirton, 1976). Consequently, we believed that investigating adaptor and innovator cognitive styles would be most pertinent given the current state of the hospitality industry's development. On one hand, employees with an adaptor cognitive style can use intelligent assistants to understand the practical approaches of other outstanding hotel groups in service encounters. On the other hand, employees with an innovator cognitive style can collaborate with intelligent assistants to devise unique service methods (Liang et al., 2022).

Cognitive Style Matching and Work Well-Being

Work well-being encompasses individuals' positive evaluations and emotional experiences related to their work, stemming from the fulfillment achieved while pursuing objectives like potential exploration and skill enhancement (Bastos & Barsade, 2020). In the hospitality sector, employees' work motivation and energy are often influenced by the degree of match between job demands and job resources. The JD-R model indicates that when work resources are not sufficiently matched with employee needs, the resulting stress can lead to a decline in employee work engagement and the emergence of burnout; conversely, a match between employees' job demands and job resources can significantly enhance employee work well-being and organizational performance (Morin et al., 2023). Previous research has demonstrated that when employees successfully adjust work resources to meet job demands, their job satisfaction and work well-being are significantly enhanced. Conversely, evading job demands to align with available resources can impede their job performance and well-being, ultimately leading to burnout (Demerouti et al., 2015).

Intelligent assistants in the hospitality sector introduce a novel work dynamic, influencing employee attitudes based on cognitive style diversity (Kirton, 1976). Employees with an adaptor cognitive style prefer experience-based guidance, in contrast to those with an innovator cognitive style, who seek unconventional solutions. Cognitive style alignment with work partners is perceived as a job resource, enhancing predictability and reducing the cognitive and emotional demands of adapting to disparate approaches. In contrast, incompatible cognitive styles may lead to resource depletion, and efforts to bridge this gap may result in increased stress and psychological tension (Wu et al., 2024), thereby reducing job satisfaction. Consequently, intelligent assistants that match employees' cognitive styles, whether adaptor or innovator, may facilitate a balance of job demands and resources, fostering work well-being. Thus, we proposed the following hypotheses:

Hypothesis 1: Intelligent assistants will facilitate higher employee work well-being when they are matched (vs. mismatched) with the cognitive style of employees.

Hypothesis 1a: An adaptor cognitive style match (vs. mismatch) of employees and intelligent assistants will facilitate higher employee well-being.

Hypothesis 1b: An innovator cognitive style match (vs. mismatch) of employees and intelligent assistants will facilitate higher employee well-being.

The Mediating Role of Cognitive Dissonance

Cognitive dissonance refers to the state of conflict that an individual faces when making a decision or taking an action after being exposed to information that contradicts their inherent perceptions (Foley, 2024). This psychological state can hinder decision making and induce negative emotions and stress. Hospitality employees utilizing intelligent assistants may face interactions misaligned with their cognitive style, leading to cognitive dissonance (Song et al., 2024). According to the JD–R model, job demands induce health impairment. Employees with an adaptor cognitive style tend to follow established rules and procedures (Kirton, 1976); when they are assigned an intelligent assistant with an innovator cognitive style, the intelligent assistant may become a job demand, hindering the employee's established thinking and thereby causing higher cognitive dissonance. Conversely, employees with an innovator cognitive style tend to explore and innovate (Kirton, 1976); when they are assigned an intelligent assistant with an adaptor cognitive style, it may also cause higher cognitive dissonance. Cognitive dissonance will lead to further depletion of psychological resources, which, in turn, can have a negative impact on work well-being and satisfaction (Loo et al., 2021). Thus, we proposed the following hypothesis:

Hypothesis 2: Mismatching of an employee's cognitive style with that of an intelligent assistant will trigger cognitive dissonance, reducing the employee's work well-being.

The Mediating Role of Work Energy

Work energy consists of an individual's physical energy and energy activation, where *physical energy* reflects the biological aspects of an individual's attributes and *energy activation* reflects the individual's subjective perception of vitality or enthusiasm (Quinn et al., 2012). When employees collaborate with work partners who share the same cognitive style, their compatible thinking patterns can increase mutual trust (M. M. Wang et al., 2023), which contributes to the acquisition of work energy. A match between an employee and an intelligent assistant in terms of cognitive style generates higher work energy in employees (Morin et al., 2023). Previous research has shown that the higher the level of work energy among employees, the more positivity they can maintain when facing work challenges and actively seeking solutions, which helps to improve their job satisfaction and work well-being (Zou et al., 2024). Therefore, we proposed the following hypothesis:

Hypothesis 3: A match in cognitive style between an employee and an intelligent assistant will stimulate the employee's work energy, enhancing their work well-being.

The research framework is shown in Figure 2.

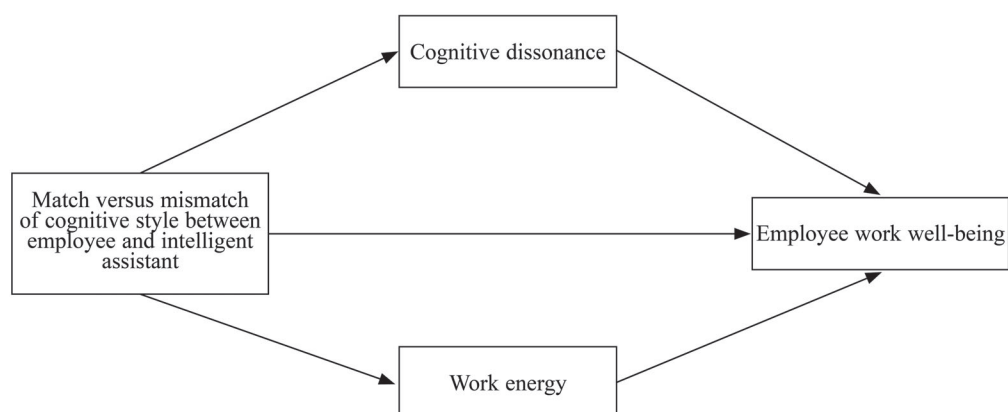


Figure 2. *Research Framework*

Experiment 1

Method

In Experiment 1, we adopted a 2 (intelligent assistant cognitive style: adaptor vs. innovator) $\times$ 2 (employee cognitive style: adaptor vs. innovator) between-subjects design. Consistent cognitive styles were classed as a match; otherwise, there was a mismatch. The experimental questionnaire was distributed through the Wenjuanxing platform, using its sampling service to recruit grassroots employees working in the housekeeping department of hospitality companies. We received surveys from 176 participants and retained 150 valid responses (63.3% women, 36.7% men).

Considering that AI is increasingly focusing on anthropomorphic design, and that positive human–AI interaction should shape the cognitive style an AI is designed to display in a human-centered manner (Rahwan et al., 2019), we measured the cognitive styles of both employee and intelligent assistant by adapting the scale developed by Kirton (1976) to form eight items ($\alpha = .89$), such as “I prefer an innovative way of thinking rather than following empirical methods” and “This intelligent assistant displays innovative ways of thinking rather than following empirical practices.” We measured work well-being by adapting the scale by Benson et al. (2019) to form four items ($\alpha = .85$), such as “Collaborating with this intelligent assistant makes me feel satisfied with my work.” All items were rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*).

Procedure

First, we obtained ethical approval from our institutional review committee, introduced the purpose of the research to the respondents, and obtained their informed consent. We screened out participants who answered “no” to the questions “I am aware of intelligent assistants such as ChatGPT or Kimi” and “I have used at least one intelligent assistant at work.” Participants assessed their own cognitive style, then they were randomly assigned to a scenario of collaborating with an intelligent assistant in hotel work (see Figure 3). Next, participants evaluated the cognitive style of the intelligent assistant and were asked to imagine working with this intelligent assistant, after which they rated their work well-being and assessed the authenticity of the scenario (X. Xu & Liu, 2022). Finally, participants provided basic demographic information.

Adaptor cognitive styles	AI: Hi, my master. I am your personal intelligent assistant, Gugu. I'm very happy to meet you! You can communicate with me about any work-related issues. Me: Hello! A guest has complained that their room is not clean enough. What do you think I should do? AI: I suggest following the standard procedure of the hotel industry: apologize to the guest and reclean their room. At the same time, you can provide the guest with some additional services, such as offering fruit or drinks, to make up for their dissatisfaction.
Innovator cognitive styles	AI: Hi, my master. I am your personal intelligent assistant, Gugu. I'm very happy to meet you! You can communicate with me about any work-related issues. Me: Hello! A guest has complained that their room is not clean enough. What do you think I should do? AI: In addition to apologizing to the guest and recleaning their room according to standard procedure, you could consider offering some innovative services, such as upgrading their room or providing a complimentary spa service. Moreover, leaving a personalized apology letter in the guest's room would express your sincerity. You could also invite the guest to fill out a survey to understand more about areas for improvement.

Figure 3. *Experimental Materials*

Results

Manipulation Check

Paired-samples *t* tests showed that the respondents tended to judge intelligent assistants with adaptor cognitive styles as having an adaptor cognitive style, $M_{\text{adaptor}} = 11.91$, $SD = 0.23$; $M_{\text{innovator}} = 9.74$, $SD = 0.28$; $t(74) = 5.95$, $p < .001$, and those with innovator cognitive styles as having an innovator cognitive style, $M_{\text{innovator}} = 15.64$, $SD = 0.18$; $M_{\text{adaptor}} = 11.77$, $SD = 0.25$; $t(74) = 13.88$, $p < .001$. Thus, the manipulation of the cognitive style of the intelligent assistant was successful.

Main Effect Check

The interaction term of the cognitive styles of employee and intelligent assistant was used as the independent variable (i.e., the degree of matching), and employees' work well-being was used as the dependent variable, with gender, age, and education level as the control variables in an analysis of variance (ANOVA). The results showed that compared to the situation of a cognitive style mismatch, employees' work well-being was stronger when the cognitive styles were matched, $F(1, 150) = 89.06$, $p < .001$; thus, Hypothesis 1 was supported (see Figure 4). Specifically, employees with adaptor cognitive styles showed enhanced work well-being when matched with intelligent assistants with an adaptor cognitive style, $M_{\text{adaptor}} = 15.97$, $M_{\text{innovator}} = 12.21$, $F(1, 82) = 115.32$, $p < .001$; thus, Hypothesis 1a was supported. Further, employees with innovator cognitive styles showed enhanced work well-being when matched with intelligent assistants with an innovator cognitive style, $M_{\text{innovator}} = 16.56$, $M_{\text{adaptor}} = 11.00$, $F(1, 68) = 143.59$, $p < .001$; therefore, Hypothesis 1b was supported.

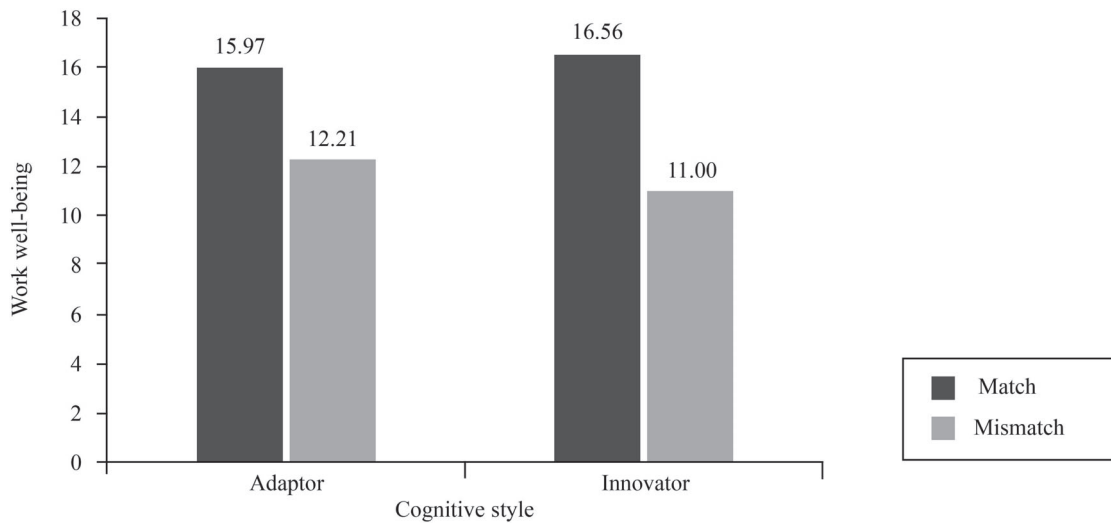


Figure 4. *Main Effect Check*

Experiment 2

Method

Experiment 2 adopted the same 2×2 between-subjects design as Experiment 1, with the main purpose of testing Hypotheses 2 and 3. The experimental questionnaire was distributed through Wenjuanxing to grassroots employees working in the restaurant department of hospitality companies. We received surveys from 220 participants and retained 202 valid responses (58.2% women, 41.8% men).

We measured cognitive dissonance by adapting the scale developed by Sweeney et al. (2020), which consists of seven items ($\alpha = .91$), with a sample item being “Working with this intelligent assistant makes me feel uncomfortable.” Work energy was assessed with the scale by Atwater and Carmeli (2009), which consists of eight items ($\alpha = .90$), with a sample item being “Collaborating with this intelligent assistant makes me feel vitality and energy in my work.” Items were rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Extending the procedure of Experiment 1, in this experiment we added a step for assessing cognitive dissonance and work energy before measuring the respondents’ work well-being. The experimental materials are shown in Figure 5.

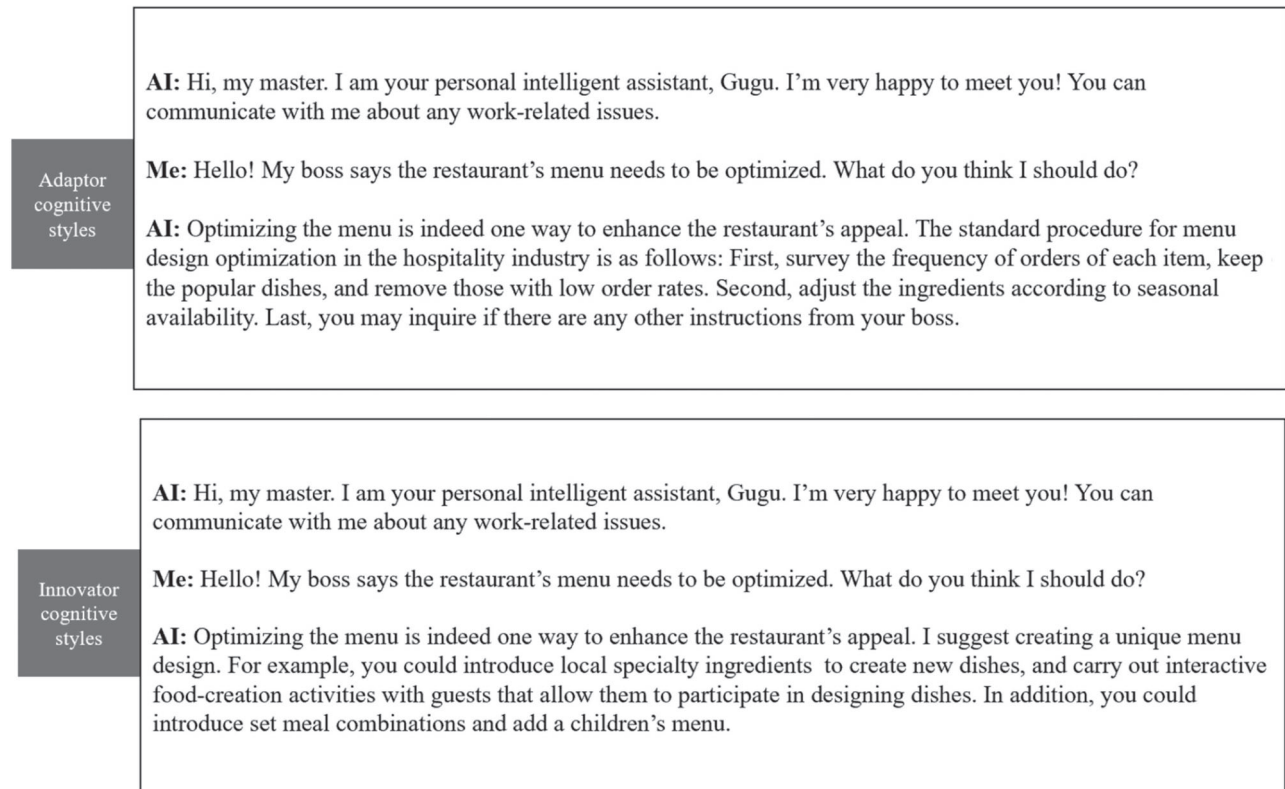


Figure 5. *Experimental Materials*

Results

Manipulation Check

Paired-samples t tests showed that the respondents tended to judge intelligent assistants with adaptor cognitive styles as having an adaptor cognitive style, $M_{\text{adaptor}} = 15.94$, $SD = 1.46$; $M_{\text{innovator}} = 11.35$, $SD = 2.94$; $t(101) = -14.11$, $p < .001$, and those with innovator cognitive styles as having an innovator cognitive style, $M_{\text{innovator}} = 16.59$, $SD = 1.63$; $M_{\text{adaptor}} = 12.32$, $SD = 2.40$; $t(101) = 14.14$, $p < .001$. Thus, the manipulation of the cognitive style of the intelligent assistant was successful.

Main Effect Check

The interaction term of the cognitive styles of employee and intelligent assistant was used as the independent variable (i.e., the degree of matching), and employees' work well-being was used as the dependent variable, with gender, age, and education level as the control variables for an ANOVA. The results showed that compared to the situation of a cognitive style mismatch, employees' work well-being was stronger when the cognitive styles were matched, $F(1, 202) = 80.04$, $p < .001$; thus, Hypothesis 1 was supported. Specifically, employees with adaptor cognitive styles showed enhanced work well-being when matched with intelligent assistants with an adaptor cognitive style, $M_{\text{adaptor}} = 11.93$, $M_{\text{innovator}} = 7.91$, $F(1, 106) = 144.72$, $p < .001$; therefore, Hypothesis 1a was supported. Further, employees with innovator cognitive styles showed enhanced work well-being when matched with intelligent assistants with an innovator cognitive style, $M_{\text{innovator}} = 12.57$, $M_{\text{adaptor}} = 8.91$, $F(1, 96) = 89.30$, $p < .001$; as such, Hypothesis 1b was supported.

Mediation Effect Check

To examine whether work energy and cognitive dissonance mediate the interaction effect of cognitive style matching between intelligent assistants and employees on work well-being, we conducted a bootstrapping analysis with Model 8

of the PROCESS macro (5,000 resamples). The results are shown in Figure 6. In the context of cognitive style matching, the mediating effect of work energy, $b = 4.74$, 95% confidence interval (CI) [4.131, 5.361], and the direct effect of the interaction term on work well-being, $b = 1.39$, 95% CI [0.376, 2.494], were significant. In the context of cognitive style mismatching, the mediating effect of cognitive dissonance, $b = -0.55$, 95% CI [-1.070, -0.077], and the direct effect of the interaction term on work well-being, $b = -1.16$, 95% CI [-2.053, -0.358], were significant. Thus, Hypotheses 2 and 3 were supported.

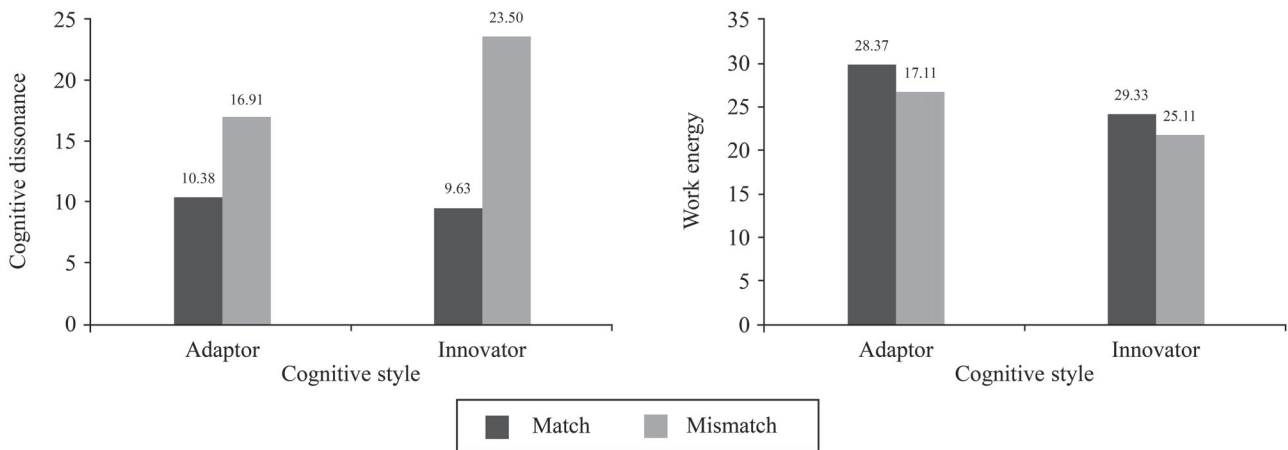


Figure 6. *Mediation Effect Check*

Experiment 3

Method

In this experiment, we changed the experimental material from text to pictures (see Figure 7). Once again, we used Wenjuanxing to recruit frontline hospitality employees. We received surveys from 347 participants and retained 314 valid responses (59.4% women, 40.6% men).

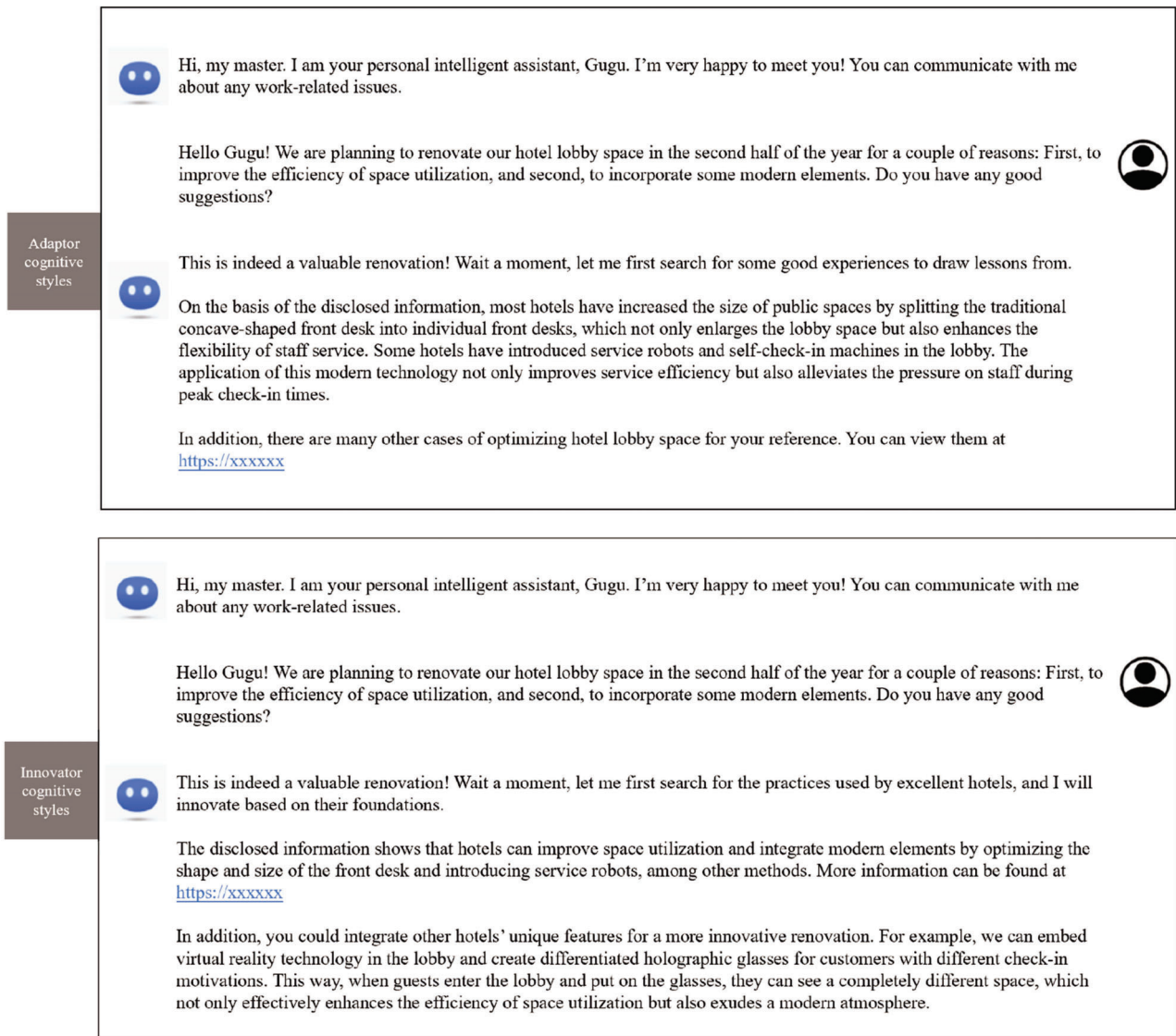


Figure 7. *Experimental Materials*

Results

Manipulation Check

Paired-samples t tests showed that the respondents tended to judge intelligent assistants with adaptor cognitive styles as having an adaptor cognitive style, $M_{\text{adaptor}} = 12.18$, $SD = 0.22$; $M_{\text{innovator}} = 9.92$, $SD = 0.23$; $t(157) = -8.628$, $p < .001$, and those with innovator cognitive styles as having an innovator cognitive style, $M_{\text{innovator}} = 11.10$, $SD = 0.22$; $M_{\text{adaptor}} = 7.63$, $SD = 0.21$; $t(155) = 11.078$, $p < .001$. Thus, the manipulation of the cognitive style of the intelligent assistant was successful.

Main Effect Check

The interaction term of the cognitive styles of employee and intelligent assistant was used as the independent variable (i.e., the degree of matching), and employees' work well-being was used as the dependent variable, with gender, age, and education level as the control variables for an ANOVA. The results showed that compared to the situation of a



cognitive style mismatch, employees' work well-being was stronger when the cognitive styles were matched, $F(1, 314) = 23.38, p < .001$; therefore, Hypothesis 1 was supported once again. Specifically, employees with adaptor cognitive styles showed enhanced work well-being when matched with intelligent assistants with an adaptor cognitive style, $M_{\text{adaptor}} = 13.15, M_{\text{innovator}} = 10.04, F(1, 148) = 22.66, p < .001$; thus, Hypothesis 1a was supported. Further, employees with innovator cognitive styles showed enhanced work well-being when matched with intelligent assistants with an innovator cognitive style, $M_{\text{innovator}} = 14.49, M_{\text{adaptor}} = 10.76, F(1, 166) = 45.92, p < .001$; thus, Hypothesis 1b was supported.

Mediation Effect Check

To examine whether work energy and cognitive dissonance mediate the interaction effect of cognitive style matching between intelligent assistants and employees on work well-being, we conducted a bootstrapping analysis with Model 8 of the PROCESS macro (5,000 resamples). In the context of cognitive style matching, the mediating effect of work energy, $b = 4.27, 95\% \text{ CI } [3.206, 5.371]$, and the direct effect of the interaction term on work well-being, $b = 2.53, 95\% \text{ CI } [0.542, 4.308]$, were significant. In the context of cognitive style mismatching, the mediating effect of cognitive dissonance, $b = -1.23, 95\% \text{ CI } [-2.201, -0.199]$, and the direct effect of the interaction term on work well-being, $b = -2.39, 95\% \text{ CI } [-4.364, -0.422]$, were significant. Thus, Hypotheses 2 and 3 were further supported.

General Discussion

We conducted three experiments to examine the impact and mechanisms of matching or mismatching of cognitive styles of employees and intelligent assistants on employee work well-being. Experiment 1 demonstrated that a match between the cognitive style of an employee and an intelligent assistant significantly affected work well-being. Specifically, when employees had an adaptor (innovator) cognitive style, the intelligent assistant adopting an adaptor (innovator) cognitive style helped to increase work well-being. The results of Experiment 2 suggested that cognitive dissonance and work energy played mediating roles in the impact of matching (vs. mismatching) between the cognitive styles of employees and intelligent assistants on work well-being. Experiment 3, which presented the experimental materials in the form of images, once again supported the research conclusions of Experiment 2.

Theoretical Contributions

This study explored the optimal strategies for collaboration between intelligent assistants and employees from the perspective of cognitive style matching, in order to enhance employees' work well-being. Previous research has primarily revealed the mechanisms by which intelligent assistants enhance or detract from employees' psychological resources from the perspectives of intelligence type (Q. Wang et al., 2024) and intelligence level (Robert et al., 2020), with some studies further investigating the impact of intelligent assistants on employees' work well-being through role types (X. Liu & Xie, 2024) and appearance (Y.-C. Wang et al., 2024). Although these studies provide valuable insights into the relationship between intelligent assistants and employee mental health, the social attributes of technology, which emphasize that positive human–AI interaction should shape the cognitive style that AI algorithms are trained to display in a human-centered manner (Rahwan et al., 2019), have not been fully explored. According to the JD–R model, employees with different cognitive styles have differentiated job demands. When job demands do not match job resources, employees' work well-being is compromised. Building on this, the current study investigated the impact of cognitive style matching between employees and intelligent assistants on employees' work well-being. The research conclusions provide a beneficial supplement to the study of intelligent assistants in the field of organizational management and also answer Rahwan et al.'s (2019) call for research into the matching of AI with human cognitive styles.

Further, our study found that cognitive dissonance and work energy mediated the impact of the cognitive style matching between intelligent assistants and employees on work well-being. This not only provides a comprehensive theoretical framework but also offers empirical evidence elucidating the complex mechanisms by which the matching of cognitive styles affects employee psychological health. Additionally, the use of AI in the hospitality industry is becoming increasingly common (Liang et al., 2022). However, there has been relatively little research on how the use of intelligent assistants affects the psychological health of employees in the hospitality sector, especially from the perspective of

digital characteristics and resource dynamics (X. Liu & Xie, 2024). This study has delved into the internal mechanisms of the effects of cognitive style matching between intelligent assistants and employees on employee work well-being, enhancing understanding of the antecedents and consequences of these psychological states in the hospitality industry.

Practical Contributions

Our results indicate that matching cognitive styles in intelligent assistants with employees can enhance work well-being. Thus, hospitality managers should focus on creating personalized interaction models that develop assistants to align with the cognitive styles of employees. When the cognitive styles of employees and intelligent assistants match, it will generate work energy and enhance employees' work well-being. Conversely, mismatches can lead to cognitive dissonance and decreased well-being. Hospitality managers should pay attention to the interaction effect between employees and intelligent assistants, collect feedback, and optimize the cognitive style of intelligent assistants to meet the needs of employees, in order to effectively enhance the sense of well-being among employees at work.

Limitations and Directions for Future Research

This study has highlighted effective human–AI interaction methods but overlooked organizational factors. Future research could integrate these factors into the model. Additionally, while various experimental materials were used, the external validity of online experiments remains constrained. Future studies could consider conducting field experiments to improve both internal and external validity. Finally, future investigations could examine potential mediating variables other than cognitive dissonance and work energy.

Acknowledgments

This study was financially supported by the Social Science Foundation of Hunan Province (2021JJ30458).

The data that support the findings of this study are available on request from the corresponding author.

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