



Attitudes Toward AI-powered Robots in Policing: AI Literacy, Organizational Justice, and Occupational Wellbeing Among Chinese Police Officers

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Abstract

The widespread implementation of digital technologies, such as big data, artificial intelligence, and cloud computing, has profoundly transformed policing in China. Several Chinese cities have recently launched humanoid robots performing patrol duty. However, little is known about frontline officers' attitudes toward police robots and the potential organizational and individual correlates of such attitudes. Using survey data from 1194 Chinese police officers, this study examines the relationships between AI literacy, organizational justice, and occupational wellbeing and officers' attitudes toward two types of humanoid police robots: a "service robot" focused on public relations and community policing and a "crime-fighting robot" engaged in surveillance, intelligence gathering, predictive policing, and criminal investigations. Chinese police officers show a stronger preference for the crime-fighting robot over the service robot. Regression results show that controlling for background characteristics, officers with greater AI knowledge, more AI training, stronger perceptions of organizational support for the use of AI, and higher self-legitimacy are more supportive of police robots. Implications for policy and future research are discussed.

Keywords Robots cops · Artificial intelligence (AI) · Organizational support · AI literacy · Chinese police

Introduction

Amidst intensifying demands on law enforcement and the growing complexity of crime, jurisdictions worldwide have begun integrating artificial intelligence (AI)-powered robots into policing operations. Countries such as China (Yang, 2025), the USA (Siff, 2024), Singapore (Chia, 2021), and the United Arab Emirates (Saseendran, 2024a, b) have piloted robotic systems with varying degrees of autonomy, often incorporating technologies such as facial recognition and predictive algorithms. These developments reflect a broader trend in the technological transformation of policing, where AI, including embodied AI (e.g., robots), is increasingly leveraged in the hope of enhancing operational efficiency, officer wellbeing, and, ultimately, public safety (Koper et al., 2015a, b; Westendorf, 2022). In China, AI-powered robots have

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been deployed in selective urban trial areas to perform tasks ranging from traffic enforcement and public engagement to surveillance and preliminary incident response (Zou, 2024). Very recently (Yang, 2025), robots with human-like appearances (i.e., humanoid robots) were introduced in these trial cities. Although their current use is largely symbolic rather than indicative of widespread operational capability, the situation is likely to change quickly as the technology continues to evolve.

While the ethical implications of police robots have received great attention globally (Zanotti et al., 2023), frontline police officers' perspectives, particularly their direct interacting experiences with the technology, remain underexamined. This gap matters, as research consistently shows that successful implementation of policing innovations depends not only on technical functionality but also on officer attitudes (Koper et al., 2015a, b; Lum et al., 2017a, 2017b). The policing literature emphasizes the importance of organizational justice and AI literacy in shaping officers' attitudes toward technological innovation (Trinkner et al., 2016). Officers' perceptions of organizational fairness, support, and role clarity influence their willingness to adopt new technologies and their trust in institutional change (Roberts & Herrington, 2013). Moreover, perceived usefulness, ease of integration, and alignment with occupational identity (e.g., as community service providers versus crime control agents) are critical to the acceptance (or rejection) of a particular technology among frontline officers (Koper et al., 2014a, 2014b; Rogers & Scally, 2018).

Against the backdrop of the rapid adoption of AI in policing, this study examines how Chinese police officers perceive the prospective integration of humanoid robots into operations, with a focus on the correlates of AI literacy, organizational justice, and occupational perceptions. The study advances the policing literature in two areas. First, to the best of our knowledge, this study represents a first attempt to investigate officers' attitudes toward AI-powered robots in performing patrol duty. We employed a cross-sectional survey design with embedded video vignettes, presenting respondents with two simulation videos: one depicting a "service robot" and the other depicting a "crime-fighting robot". Officers' responses to accompanying questions provide valuable information on police officers' attitudes toward the use of AI technology in street-level policing.

Second, we assessed the connections between theoretically relevant explanatory variables and officers' support for robot police on patrol. We considered important agency and individual correlates of officers' occupational outlooks toward technology, including their perceptions of AI literacy, organizational justice, and occupational wellbeing. This study is critical for understanding the psychosocial and institutional dynamics related to officers' perceptions of AI-powered robots in law enforcement.

Drawing on a survey of 1194 police officers in China, this study is designed to address two research questions: (1) Do officers' support for advanced technology vary by different types of AI-powered robots; and (2) Are officers' perceived AI literacy, organizational justice, and occupational wellbeing related to their support for service and crime-fighting robots? This study generates the first and important evidence on police officers' attitudes toward AI-powered robots and their correlates. The findings are also expected to furnish critical implications for policy and future research.

The AI Transformation of Policing

Recent years have seen police agencies around the world embrace AI to enhance traditional law enforcement practices, from crime mapping and predictive analytics to automated decision-support systems (Asaro, 2019; Hossain et al., 2020). Empirical research has

shown some promising outcomes. For instance, randomized controlled trials of self-exciting point-process (ETAS) models in Los Angeles, USA, and Kent, UK, demonstrated that ETAS models predicted crime hot spots respectively 2.2 and 1.4–1.7 times more accurately than human analysts, with an average 7.4% weekly crime reduction in Los Angeles when patrols focused on model-identified areas (Mohler et al., 2015). Another US study showed that AI-driven real-time crime centers reduced response times by up to 20% and improved resource allocation (Koper et al., 2014a, b). Westendorf's (2022) analysis of Australian policing revealed how machine learning and big-data platforms enabled police to rapidly process large volumes of incident and social media data, improving situational awareness without increasing staffing.

Despite potential benefits to police's crime control efforts, scholars have cautioned that the extent of such technological gains depends on organizational readiness and the implementation of ethical safeguards to preserve procedural fairness and public trust (Lum et al., 2017a, b). Concerns have been raised about algorithmic bias, feedback loops, and accountability in predictive policing (Fitzpatrick et al., 2019; Shapiro, 2017). Specifically, models trained on historical crime data were found to risk reinforcing over-policing in poor and minority communities already subject to heightened surveillance and enforcement, particularly when predictions are driven by minor, public-order offenses (Shapiro, 2017). Without prioritizing serious, reliably reported offenses in the AI models, predictive programs can exacerbate disparities by steering police patrols towards vulnerable populations and creating self-fulfilling hot spots (Fitzpatrick et al., 2019). Further, the opacity in commercial algorithms limits transparency in police discretionary decision-making and may undermine public scrutiny and, potentially, due process (Shapiro, 2017).

The deployment of AI-powered police robots represents a new frontier in the technological transformation of policing. Although still largely experimental, such robots have been piloted in a range of jurisdictions with varying degrees of autonomy and public visibility. In February 2024, New York City Mayor Eric Adams announced the retirement of the Knightscope K5 security robot following a 2-month trial at Times Square Station. The robot, resembling R2-D2 from Star Wars in appearance, was designed to provide visibility, record footage, and assist subway passengers. However, repeated vandalism, minimal use of its emergency button, and widespread concerns over data privacy and surveillance led to its early decommissioning (Siff, 2024).

Globally, several countries have experimented with similar robotic technologies. In Singapore, the Xavier robot was deployed to patrol public spaces to detect "undesirable social behaviors" such as smoking in restricted zones or improper parking of mobility devices. Rather than enforcing infractions directly, Xavier issues warnings and relays information to human officers, reflecting a semi-autonomous, hybrid model (Chia, 2021). In China, AI-powered robots such as the AnBot have been integrated into urban security systems to conduct surveillance, verify identities, and patrol transport hubs (Sun et al., 2022; Yang, 2025). In the United Arab Emirates, robots have been used in more service-oriented roles, such as greeting tourists or providing multilingual assistance during large events (Saseendran, 2024a, b), focusing more on public engagement and community service than enforcement.

Although police robots vary in form and function, they collectively embody and reproduce divergent understandings of what policing, including its robotic extensions, should entail. In some jurisdictions, robots are positioned primarily as crime control agents, tasked with surveillance, deterrence, and enforcement support. In others, they function more as community service providers, promoting a public sense of community safety through communication, engagement, and information dissemination. These divergent roles reflect the long-standing tension between the law enforcement or crime control orientation and the

service provision and community engagement orientation of policing, while also underscoring broader ethical concerns about the application of AI in law enforcement.

AI-Powered Robots and Their Policing Roles

Much policing research has explored how both officers and the public conceptualize the police role. Traditionally viewed as “crime fighters” or “guardians of public order,” officers were conferred broad authority and legitimized use of coercive force to maintain social control. In more recent decades, however, this role has expanded to encompass crime prevention and community service, including assisting citizens, building trust, and addressing local problems through collaboration (Herbert, 2006; Paoline, 2003). The dual imperatives of “crime control” and “community service” often coexist within police organizations and individuals, at times producing competing operational priorities. As AI-powered police robots are increasingly deployed, these role tensions re-emerge in new, technologically mediated forms. Like their human counterparts, robotic systems are designed to fulfill both crime control and service functions, such as crowd monitoring or identifying infractions (e.g., unauthorized vending or smoking), while also providing navigation assistance or disseminating health-related information (Chia, 2021; UNICRI, 2025). These dual roles suggest that the existing conceptual frameworks for understanding officer role orientations and conflicts may apply to police robots as well.

Officers may demonstrate differential support for crime-fighting robots compared to service robots, reflecting their own role orientations. Despite community policing reforms and training, many officers continue to show stronger endorsement of “crime-fighter” roles relative to “service” roles, particularly

in organizations that emphasize measurable enforcement outcomes, aggressive patrol, or zero-tolerance policies (Cuvelier et al., 2015; Ivković, 2008; Paoline & Terrill, 2014; Patterson, 2011). Organizational factors such as hierarchy also influence role orientation, with officers working in higher level police departments tending to be less characterized by a crime-fighting mentality, suggesting that organizational rank is inversely related to a crime-fighting orientation (Chen et al., 2016). Other factors have also been found to predict stronger crime-fighting. Officers who were more cynical or closely aligned with traditional police culture were more likely to favor tougher law enforcement orientations (Paoline et al., 2003; Terrill et al., 2003). Furthermore, police officers with military backgrounds or thrill-seeking personalities are more inclined to identify with the action-driven “crime-fighter” role culture. In contrast, officers with a community-oriented mindset are more likely to adopt a “social worker” or problem-solving role, focusing on service, conflict resolution, and long-term community wellbeing (Sollund, 2008).

Based on extensive research demonstrating the persistence of crime-fighter culture in policing organizations (Fuller & Smith, 2014; Skolnick, 2011; Van Maanen, 1973), we hypothesize that officers will express stronger support for robots that align with their traditional enforcement-oriented role conception. While community policing initiatives have expanded police responsibilities to include service functions, the core occupational identity of most officers remains anchored in crime control and law enforcement activities (Crank, 2004; Herbert, 2006). This cultural orientation should manifest in differential acceptance of robotic technologies, with greater enthusiasm for robots designed for surveillance, deterrence, and enforcement support compared to those focused on community service and public relations functions. Understanding these anticipated differences in robot acceptance

requires examining the specific factors that may influence officers' attitudes toward AI-powered technologies.

Correlates of Police Attitudes toward AI-powered Robots

Officers' support for the implementation of AI-powered robots may be linked to their broader tendency toward adopting technology in policing. Research has shown that technology adoption in police organizations is influenced by multiple factors, including organizational culture and policy, officers' openness to technology, training and support systems, and officers' perceptions of technology effectiveness and trustworthiness (Bradford et al., 2020; Cochran et al., 2023; Koper et al., 2015a, b). Recognizing that various factors may be related to officers' attitudes toward AI robots in policing, this study focuses on three groups of correlates: AI literacy, organizational support, and occupational wellbeing.

Recognizing that various factors may be related to officers' attitudes toward AI robots in policing, this study focuses on three groups of correlates: AI literacy, organizational support, and occupational wellbeing. First, AI knowledge and training may impact officer support for using digital technologies such as AI robots. Academy and in-service training are common mechanisms for officers to enhance their AI literacy, such as their awareness, knowledge, and skills in utilizing advanced technology in policing. Officers can also acquire valuable knowledge and skills through the social learning process of observing, modeling, and emulating supervisors and co-workers (Bandura, 1971). The theoretical rationale for this relationship is strengthened by recent research on human–robot interaction in law enforcement contexts. Studies examining teleoperated communication robots in police work have demonstrated that training in both expressive skills (e.g., communication techniques) and functional skills (e.g., robot operation) significantly fosters trust and acceptance of robotic technologies among officers (Bordbar et al., 2021; Salehzadeh et al., 2025). These studies reveal that self-efficacy is positively associated with officer acceptance of robotic systems, suggesting that comprehensive training programs that build officers' confidence in their ability to effectively operate and interact with robotic technologies are crucial for successful implementation. However, limited empirical studies have demonstrated that education and training in technology, as well as knowledge of technological systems and software, affect innovation processes in police agencies. By integrating AI components into training programs, agencies can enhance personnel proficiency, reduce costs, and better prepare officers for the complex realities of contemporary policing (Ernst et al., 2021; Police 1, 2024), likely fostering their favorable attitudes toward advanced technology, such as police robots.

Second, we propose that organizational support is related to police officers' acceptance of AI robot implementation. Organizational support theory posits that employees develop a generalized perception (i.e., perceived organizational support) based on how an organization recognizes its members' contributions and cares about their wellbeing and safety (Eisenberger et al., 1986). In the context of robotic policing, organizational support encompasses not only traditional elements, such as supervisor justice and fair and pragmatic departmental regulations, but also technology-specific training programs and ethical accountability measures that help officers navigate the complexities of human–robot collaboration. Research on police technology adoption demonstrates that organizational backing through fair policies and supervisory support can reduce feelings of injustice or burnout while facilitating alignment with organizational goals, such as implementing new

technologies (Adams, 2025; Adams & Mastracci, 2019). The policing literature has suggested that organizational support, such as supervisor justice, professional training, and departmental regulations, can effectively change frontline officers' attitudes and behaviors (Franklin et al., 2020; Smith et al., 2016). Empirical research on the Chinese police also demonstrates a positive relationship between organizational support and successful police reform initiatives, specifically regarding improving public satisfaction and officer compliance (Sun et al., 2018). The broader organizational context, including culture, structure, and leadership, also plays a crucial role in influencing officers' attitudes toward new technologies and determining the effectiveness of technological integration. The full benefits of technological advances can only be realized when police executives implement necessary supportive organizational changes (Ernst et al., 2021; Koper et al., 2015a, b).

Third, we posit that occupational wellbeing, such as stress and self-legitimacy, affects officers' support for AI adoption. Occupational stress refers to the adverse psychological and physical effects experienced during police work. Extensive literature has shown that elevated stress levels negatively impact officers' performance, decision-making, and interactions with the public (Shane, 2010; Wu et al., 2021). Research studies further demonstrate that occupational stress and burnout can reduce officers' motivation for professional development and technology acquisition, as stressed officers may be less inclined to embrace new learning opportunities or adapt to technological changes (Craddock & Tellesco, 2022; Gomes et al., 2022). Additionally, stress can impair memory and cognitive processing, potentially affecting officers' ability to effectively learn and utilize new technologies, such as robotic systems (Di Nota et al., 2021). Past studies on the Chinese police have employed the general strain theory (Agnew, 1992) to assess how officers' psychological conditions were associated with their street-level treatment of the public (Wu et al., 2018). We therefore expect occupational stress to be negatively associated with support for AI usage in policing. Meanwhile, self-legitimacy reflects officers' confidence in their authority and belief in their entitlement to power as law enforcement agents (Gau & Paoline, 2021). Since frontline officers' attitudes toward new technologies are shaped by the extent to which they believe these technologies align with existing role conceptions (Koper et al., 2014a, b; Rogers & Scally, 2018), we expect officers with greater self-legitimacy to demonstrate stronger support for robotic policing.

Robotic Policing in China

The future of robotic policing in China is likely to be defined by continued expansion, consolidation, and normalization within the broader architecture of state-led social governance. The developments between 2024 and 2025 mark a pivotal transition from isolated pilot programs to full-scale deployment across multiple cities, signaling that robotic policing has been operationally integrated into China's public security system (Zhang, 2024). This trajectory reflects not only the advancement of artificial intelligence and robotics but also the compatibility of these technologies with China's centralized political structure, digital governance strategy, and a generally receptive public to automated authority. In a "high policing society" like China, robotic policing is not merely a technological enhancement but a manifestation of the state's capacity to embed advanced surveillance and enforcement tools into everyday urban life. Rather than being adjuncts to and supporting human officers, robotic units function as integral components of a vertically managed,

data-driven governance model that prioritizes real-time intervention and omnipresent monitoring, emphasizing predictability, order, and population control.

Unlike Western democracies, where ethical debates and civil liberties concerns limit the scope of robotic policing, China's political environment enables rapid and large-scale deployment with minimal public resistance. Public enthusiasm for AI is notably high, with 80% support in China compared to just 39% in Australia and 43% in New Zealand (Ipsos, 2024). This acceptance reflects deeper cultural and political values that frame AI and robotic policing deployment as not only acceptable but also signs of national progress and strength, reducing the likelihood of public debate and resistance often found in Western countries.

Looking ahead, China is well-positioned to further institutionalize robotic policing by deepening its integration with smart city infrastructures, improving coordination with existing surveillance systems, and applying algorithm tools for predictive enforcement. As deployment expands beyond pilot cities into smaller cities and diverse administrative contexts, robotic policing is expected to become a routine part of China's law enforcement framework. This trend is likely to shift Chinese policing toward a system that is heavily automated and digitally interconnected. Although complex challenges related to accountability and the exercise of discretion remain, China's convergence of technological capacity, centralized policy direction, and public acceptance allows it to advance robotic policing at a pace and scale that few other countries can currently match (Ipsos, 2024).

The Current Study

Recent criminological literature has increasingly recognized the transformative role of AI in policing and its impact on criminal justice practitioners' occupational outlooks and operational practices (e.g., Chen et al., 2025; Strom, 2017). Building on this emerging body of research, the present study investigates police officers' support for the use of service and crime-fighting robots in law enforcement. Utilizing two virtual simulation videos and accompanying questionnaires, we examine officers' attitudes toward robotic technologies in policing and their correlates. This paper represents the first empirical investigation into how AI literacy, organizational justice, and occupational wellbeing are linked to police officers' support for robotic policing tools. Based on our research questions and the review of relevant literature, we formulated and tested the following hypotheses:

H1: Police officers report greater support for the use of crime-fighting robots than service robots.

H2a: Police officers with greater AI knowledge and more extensive AI training express higher support for the use of service robots.

H2b: Police officers with greater AI knowledge and more extensive AI training display higher support for the use of crime-fighting robots.

H3a: Police officers who perceive higher AI-related organizational support and supervisor justice hold greater support for the use of service robots.

H3b: Police officers who perceive higher AI-related organizational support and supervisor justice render greater support for the use of crime-fighting robots.

H4a: Police officers experiencing lower occupational stress and higher levels of self-legitimacy demonstrate greater support for the use of service robots.

H4b: Police officers experiencing lower occupational stress and higher levels of self-legitimacy show greater support for the use of crime-fighting robots.

Methods

Research Site and Survey Instrument

A collaborative research team consisting of scholars from China, the USA, and Australia initiated a study in May 2025 to examine Chinese police officers' perceptions of the AI application in policing. The team selected a provincial capital city in northern China as the study site, drawing on an established collaborative relationship with a local provincial police college that provided crucial support for participant recruitment and survey distribution. The selected city is economically developed and serves as a major economic, political, and cultural hub in northern China.

To examine the role of AI in Chinese law enforcement, the research team developed a survey instrument featuring single-choice questions, scenario analyses, and evaluations of police robot videos. The survey was originally developed in English and then translated into Chinese using the back-translation method to ensure linguistic accuracy and consistency (Brislin, 1970). A pilot test was conducted with a small group of Chinese police officers to evaluate the clarity and appropriateness of the survey language, leading to minor modifications that improved the overall quality of the instrument.

Data Collection and Sampling

Once finalized, the survey instrument was uploaded to Tencent Questionnaire, a widely utilized online survey platform in China. Data were collected over nine days in mid-May 2025. The survey invitation, which contains a link to the online survey, was disseminated to numerous internal police WeChat groups. WeChat, the largest social media platform in China, is commonly used by government employees as well as the general public. All group members, including both sworn officers and auxiliary officers (i.e., officers hired on a contractual basis with limited enforcement authority), were invited to participate. Because many officers belong to multiple WeChat groups, the exact number of recipients was unknown, making the response rate incalculable. The survey included a cover page explaining the academic purpose of the study, detailing the affiliation and contact information of the investigators, and emphasizing the voluntary and anonymous nature of participation and strict data confidentiality (e.g., data only accessible to the research team). All study procedures adhered to ethical standards and received approval from the Institutional Review Board of the corresponding author's institution (protocol # 2314174-1). Informed consent was obtained electronically via participants' acknowledgement of having read the information on the cover page before they started the survey.

A total of 2715 responses were collected from law enforcement personnel in the sampled city. Of them, 1349 were auxiliary police officers who were excluded from the analysis given the study's focus on sworn officers with full enforcement authority. Additionally, 172 surveys were deemed invalid and thus excluded, including 31 with extremely short completion times (under 3 min) and 141 with patterned responses (same answer selected on more than 80% of the questions). The final analytic sample consisted of 1,194

responses. As presented in Table 1, 71% of the respondents were male, 88% were married, 42% were assigned to field stations, and 31% were veterans. Most officers were in the 41–45 age group, and the average educational attainment was approximately equivalent to a bachelor's degree. Due to the unavailability of official demographic data for the city's police force, sample representativeness could not be assessed.

Measures

The main measures used in this study include two dependent variables, three groups of independent variables, and six control variables. Except for officer background characteristics, all survey items are included in Appendix 1. As detailed in the Appendix, both dependent variables and the six independent variables were operationalized as additive scales, each comprising three or more items. As shown in Appendix 1, responses were measured on a six-point Likert scale ranging from “strongly disagree” (coded as 1) to “strongly agree” (coded as 6). The Cronbach's alpha coefficients for these scales ranged from .84 to .95, demonstrating high internal consistency across all constructs.

Dependent Variables

The two dependent variables are *general support for service robots* and *general support for crime-fighting robots*. Participants viewed two 30-s virtual simulation videos in their survey. The first depicted scenarios of a friendly looking humanoid robot performing

Table 1 Descriptive statistics for variables in regression analysis ($N=1194$)

Variables	<i>M</i>	<i>SD</i>	Range	α
<i>Dependent variables</i>				
Service robot—general support	31.45	6.35	7–42	.93
Crime-fighting robot—general support	32.01	6.23	7–42	.95
<i>Independent and control variables</i>				
<i>AI literacy</i>				
AI knowledge	16.48	6.61	5–30	.94
AI training	9.47	4.27	3–18	.87
<i>Perceived organizational justice</i>				
AI organizational support	17.77	4.07	4–24	.92
Supervisor justice	18.01	4.39	4–24	.94
<i>Occupational wellbeing</i>				
Occupational stress	19.71	3.53	4–24	.84
Self-legitimacy	20.35	2.80	4–24	.89
<i>Officer characteristics</i>				
Men	0.71	0.46	0–1	—
Married	0.88	0.32	0–1	—
Field station assignment	0.42	0.49	0–1	—
Military veteran	0.31	0.46	0–1	—
Age	5.42	1.72	1–8	—
Educational attainment	3.87	0.58	1–5	—

M mean, *SD* standard deviation, α Cronbach's alpha

tasks related to public engagement and service provision, including comforting a little girl who could not find her parents. The second video illustrated the scenario of a technology-enhanced humanoid robot encountering a suspicious person in a dark alley and performing intelligence collection, facial recognition, and criminal investigation functions. Appendix 2 displays the screenshots of the beginning of the two video clips, showing the distinctive appearance of the service and crime-fighting robots. After viewing each video, participants responded to the same set of seven survey questions assessing their overall acceptance of and support for these AI-powered robots (see Appendix 1 for a complete list of the items).

Independent Variables

The independent variables fall into three domains: AI literacy, perceived organizational justice, and occupational wellbeing. AI literacy includes *AI knowledge* and *AI training*. *AI knowledge* is a five-item additive scale, reflecting officers' self-reported understanding of the basic principles and various applications of artificial intelligence in crime control and law enforcement. *AI training* is a three-item additive scale, capturing officers' educational and training experiences related to computer science, programming, and artificial intelligence.

Perceived organizational justice comprises *AI organizational support* and *supervisor justice*. The *AI organizational support* scale was measured based on four items, signaling officers' perceptions of institutional and supervisory support for AI-related training and skills development. The *supervisor justice* variable is a four-item scale, indicating officers' perceptions of fair and respectful treatment by their supervisors.

Occupational wellbeing includes *occupational stress* and *self-legitimacy*. Both are four-item additive scales, reflecting officers' perceived work-related stressors and confidence in the legitimacy of their authority. The survey items used to measure AI organizational support, supervisor justice, occupational stress, and self-legitimacy were employed in prior research on Chinese police officers (e.g., Chen et al., 2025; Ha et al., 2024), whereas the rest of the AI-related items were created by the research team.

Several officer characteristics were included as control variables in the regression analyses. Four of these were coded as dummy variables: gender (0 = women, 1 = men), marital status (0 = others, 1 = married), field station assignment (0 = non-field station, 1 = field station), and military veteran (0 = non-veteran, 1 = veteran). Age was measured using an eight-point ordinal scale ranging from 21–25 years (coded as 1) to 56–60 years (coded as 8). Educational attainment was assessed on a six-point ordinal scale, with response options ranging from a high school diploma (coded as 1) to a graduate degree (coded as 6). Descriptive statistics for all variables included in the analysis and the correlational matrix for key variables are presented in Tables 1 and 2, respectively.

Analytic Strategy

To test the research hypotheses, we employed a two-step analytical approach. First, we performed a paired-samples *t*-test to examine differences in police officers' support between service robots and crime-fighting robots. Next, we estimated ten linear regression models examining the relationships between the predictor variables and the two dependent variables: general support for service robots and general support

Table 2 The correlational matrix for the eight key variables* ($N=1194$)

Variable	1	2	3	4	5	6	7	8	
Service robot—general support	1	1							
Crime-fighting robot—general support	2	.81***	1						
AI knowledge	3	.32***	.32***	1					
AI training	4	.29***	.27***	.76***	1				
AI organizational support	5	.25***	.28***	.26***	.24***	1			
Supervisor justice	6	.18***	.20***	.17***	.16***	.62***	1		
Occupational stress	7	.06*	.07*	-.10**	-.11***	-.11***	-.07*	1	
Self-legitimacy	8	.25***	.27***	.16***	.11***	.33***	.35***	.19***	1

* $p < .05$; ** $p < .01$; *** $p < .001$

for crime-fighting robots. For each dependent variable, we constructed five separate regression models: (1) officer characteristics only; (2) officer characteristics and AI literacy; (3) officer characteristics and organizational justice; (4) officer characteristics and occupational wellbeing; and (5) a full model incorporating officer characteristics, AI literacy, organizational justice, and occupational wellbeing.

Results

T-Test Comparing General Support for Two Types of Robots

A paired-samples t-test was conducted to examine the differences in police officers' support between service robots and crime-fighting robots. Consistent with our first hypothesis (H1),

The results indicated that participants reported statistically significant higher support for crime-fighting robots ($M=32.01$, $SD=6.23$) compared to service robots ($M=31.45$, $SD=6.35$), $t(1193)=-5.018$, $p < .001$, Cohen's $d=-0.145$, 95% CI $[-0.775, -0.339]$. Suppose we use the middle point of the scales as the cutting-off value for favorable and unfavorable attitudes toward the robots. In that case, the mean values (31.45 and 32.01) are much higher than the middle point of both scales (24.5), suggesting a high support for service and crime-fighting robots among Chinese police officers.

Multiple Regression Models Predicting General Support for Service Robots

Table 3 presents the results of multiple regression analyses predicting general support for service robots. Model 1 includes only demographic variables, with gender emerging as a significant predictor, with male officers demonstrating greater support for using service robots than their women counterparts. In Model 2, variables representing AI literacy, namely AI knowledge and AI training, were added alongside the demographic controls. Supporting H2a, both variables are significant predictors. Officers with greater AI literacy

Table 3 Multivariate regression predicting service robot—general support^a (N = 1194)

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
<i>Officer characteristics</i>										
Men	.93*	.41	.18	.39	.94*	.40	.58	.40	-.00	.39
Married	-.97	.65	-.27	.62	-.76	.63	-.75	.63	-.17	.60
Field station assignment	-.27	.38	-.19	.36	.17	.37	-.35	.38	-.16	.36
Military veteran	-.14	.42	-.42	.40	-.16	.40	-.02	.40	-.31	.39
Age	.22	.13	.22	.12	.33**	.13	.20	.13	.27*	.12
Educational attainment	.19	.33	.12	.31	.12	.32	.04	.32	-.01	.30
<i>AI literacy</i>										
AI knowledge			.23***	.04					.18***	.04
AI training			.17**	.06					.16**	.06
<i>Perceived organizational justice</i>										
AI organizational support					.36***	.06			.21***	.06
Supervisor justice					.07	.05			.01	.05
<i>Occupational wellbeing</i>										
Occupational stress							.02	.05	.14**	.05
Self-legitimacy							.56***	.07	.34***	.07
<i>F-test</i>	1.68		18.86***		11.86***		11.08***		20.58***	
<i>R²</i>	.01		.11		.07		.07		.17	
<i>Adjusted R²</i>	.00		.11		.07		.06		.17	

^aEntries are standardized regression coefficients and standard errors

* $p < .05$; ** $p < .01$; *** $p < .001$

are associated with higher support for using service robots in policing. Gender is no longer significant, suggesting that AI literacy may explain the initial gender difference in Model 1. Model 3 replaced AI literacy variables with perceived organizational justice variables: AI organizational support and supervisor justice. Gender and age are positively associated with support, with male officers and older officers expressing greater support for service robots. Perceived AI organizational support is also significant, indicating that officers who perceive greater AI organizational support have greater support for service robots. However, supervisor justice is not significant, providing partial support for H3a. Model 4 substituted organizational justice variables with occupational wellbeing, including occupational stress and self-legitimacy. Only self-legitimacy reached statistical significance, partially supporting H4a. Officers with higher self-legitimacy are more supportive of service robots compared to those with lower perceptions. Model 5 incorporated all variables, finding that age, AI knowledge, AI training, AI organizational support, occupational stress, and self-legitimacy are all positively associated with general support for service robots. The explanatory variables together account for 17% of the variation in support for service robots.

Table 4 Multivariate regression predicting crime-fighting robot—general support^a ($N = 1194$)

Variables	Model 6		Model 7		Model 8		Model 9		Model 10	
	B	SE	B	SE	B	SE	B	SE	B	SE
<i>Officer characteristics</i>										
Men	1.02*	.40	.29	.39	1.04**	.39	.64	.39	.12	.38
Married	-.24	.64	.41	.61	-.01	.61	-.01	.62	.51	.59
Field station assignment	.06	.38	.13	.36	.55	.36	-.03	.37	.20	.35
Military veteran	-.18	.41	-.43	.40	-.21	.39	-.06	.40	-.32	.38
Age	.13	.13	.13	.12	.25*	.12	.11	.12	.19	.12
Educational attainment	.09	.33	.03	.31	.00	.31	-.08	.31	-.12	.30
<i>AI literacy</i>										
AI knowledge			.23***	.04					.18***	.04
AI training			.13*	.06					.12*	.06
<i>Perceived organizational justice</i>										
AI organizational support					.40***	.05			.26***	.05
Supervisor justice					.08	.05			.02	.05
<i>Occupational wellbeing</i>										
Occupational stress							.03	.05	.15**	.05
Self-legitimacy							.59***	.06	.35***	.07
<i>F-test</i>	1.36		17.64***		15.06***		12.62***		22.46***	
<i>R²</i>	.01		.11		.09		.08		.19	
<i>Adjusted R²</i>	.00		.10		.09		.07		.18	

^aEntries are standardized regression coefficients and standard errors

* $p < .05$; ** $p < .01$; *** $p < .001$

Multiple Regression Models Predicting General Support for Crime-fighting Robots

Table 4 presents the results of multiple regression analyses examining general support for crime-fighting robots. Model 6 examined only demographic variables, with gender as the sole significant predictor. Male officers exhibited greater support for the crime-fighting robot compared to their women counterparts. Model 7 introduced AI literacy variables (AI knowledge and AI training) while retaining demographic controls. Supporting H2b, both AI knowledge and training demonstrated statistical significance, while gender is no longer a significant predictor. Model 8 replaced AI literacy variables with perceived AI organizational support and supervisor justice while retaining demographic controls. Gender and age showed positive associations with support for crime-fighting robots. AI organizational support is significant, suggesting that officers who perceive stronger institutional backing for AI express greater support for crime-fighting robots. Supervisor justice is not significant, partially supporting H3b. Model 9 examined occupational wellbeing (i.e., occupational stress and self-legitimacy) instead of organizational justice. Self-legitimacy achieved statistical significance, indicating that officers with higher self-legitimacy demonstrate greater support for crime-fighting robots, partially supporting H4b. Model 10 is the full model, incorporating all variables, with five variables showing significant positive associations with support for crime-fighting robots: AI knowledge, AI training, AI organizational

support, occupational stress, and self-legitimacy. The independent and control variables explain 19% of the variation in support for crime-fighting robots.

Discussion

In recent years, police agencies around the world have increasingly adopted AI to enhance traditional law enforcement practices, including crime mapping, predictive analytics, and automated decision-support systems. AI-powered police robots are now being deployed across various jurisdictions, fulfilling roles in both crime control and public safety service. This study presents a pioneering examination of Chinese police officers' general support for both service robots and crime-fighting robots and their correlates, including AI literacy, perceptions of organizational justice, occupational wellbeing, and demographic characteristics. Several key findings are summarized and discussed below.

First, we found that Chinese police officers expressed very favorable attitudes toward the use of AI-powered robots. Such a strong supportive tendency may be related to the Chinese government's advocacy for utilizing advanced technology to conduct extensive surveillance for social stability. Our findings also show greater support for crime-fighting robots than service robots. Officers may feel that crime-fighting robots with technology-enhanced capabilities are particularly useful to strengthen their effectiveness in intelligence gathering, offense detection, and criminal apprehension. Officers may also believe that their safety would be greatly improved by having robots perform some risky tasks (e.g., control of suspects with weapons and disposal of explosive devices). However, it is important to note that while the preference for crime-fighting robots over service robots was statistically significant, the effect size was small, indicating that the practical difference in support levels between the two robot types is modest rather than substantial. Future research should further examine the factors underlying officers' supportive attitudes toward police robots, such as how their views on the ethical implications of robotic policing, particularly regarding bias, accountability, and surveillance, may influence their support for different robotic functions.

Second, we found that police officers with more extensive AI knowledge backgrounds and greater participation in AI technology training exhibit higher support for police robots, underscoring the critical importance of AI literacy initiatives in technology adoption. Our findings echo recent studies on Chinese police officers, showing, for example, that training enhanced their willingness to engage in supportive actions toward victims of domestic violence (Xue et al., 2024). Research has also consistently demonstrated that technology's effects on policing are complex and often take considerable time to materialize as agencies adapt and refine their use (Chen et al., 2025; Koper et al., 2015a, b). Given the newness of AI-related technology in policing, more studies should be conducted to further explore the long-term impact of various forms of training (e.g., academy and in-service training) and knowledge (e.g., general vs. specific) on officers' attitudes toward the perceived benefits and risks associated with AI-powered robots.

Third, as anticipated, AI organizational support demonstrates a positive association with general support for both service and crime-fighting robots, highlighting the fundamental role of organizational support in technology implementation. However, we also found that supervisor fairness does not directly influence police officers' support. These findings align with previous Chinese policing research, suggesting that AI organizational support enhances technology efficacy, while the correlation between supervisor justice and

technology efficacy was not significant (Chen et al., 2025). Despite the weak association between supervisor justice and officer supportive attitudes toward police robots, studies on Chinese police officers have consistently found that internal procedural justice (exercised by supervisors) was linked to beneficial outcomes, such as enhanced officer accountability and procedural justice in the street (Sun et al., 2019; Wu et al., 2019). More studies are warranted to investigate the connections between other types of organizational support (e.g., peer and public support) and officers' attitudes toward advanced technology.

Finally, officers' adverse and positive psychological conditions (i.e., stress and self-legitimacy) matter in their support for AI robot usage in policing. Contrary to our hypothesis, officers reporting higher stress exhibit greater support for police robot implementation. This finding may reflect recent advances in information technologies (IT), analytic systems, video surveillance, AI police robots, and other technologies (Koper et al., 2015a, b) that have demonstrated positive effects in various applications, such as AI-powered predictive policing algorithms that improve crime prediction and early warning systems. Consequently, police officers may perceive robot deployment as a means to assist or even replace human officers in performing certain tasks, thereby improving efficiency and potentially alleviating workload pressures. This finding raises important questions about how stressed officers conceptualize robots in policing. Stressed officers may particularly view AI robots as instrumental tools to reduce job strain and collaborative partners for policing effectiveness, driving their stronger support for integration. In contrast, less stressed officers may view AI robots more as functional replacements, posing threats to job security, suggesting that in high-stress occupational contexts, technology adoption may be motivated not only by operational efficiency but also by officers' desire for stress relief and workload management. Future research should examine how different robot role conceptualizations influence acceptance and implementation outcomes in police organizations. Our findings on officers' self-legitimacy extend recent studies in Chinese societies, elucidating the associations between self-legitimacy and police external procedural justice (Chen et al., 2021) and public cooperation with the police (Li et al., 2021). Given that officer self-legitimacy remains under-researched, future studies should explore how different forms of legitimacy (i.e., audience or client legitimacy) may be connected to officers' attitudes toward technology utilization.

Four limitations of this study should be acknowledged. First, the research relied on a convenience sample of police officers from a single provincial city in China. Without official demographic data on the police population in the city, we could not assess the representativeness of our sample, limiting the generalizability of our findings to other regions. Future studies should collect data across multiple regions to enhance sample representativeness and external validity. Second, although this study primarily focused on AI literacy, organizational justice, and occupational wellbeing, other relevant factors may also be related to officers' support for service and crime-fighting robots. Future research should consider such variables as AI acceptance, AI resistance, job satisfaction, and public support to provide a more comprehensive understanding of officers' attitudes toward robotic technologies. Third, our convenience sampling approach through internal police WeChat groups raises important concerns about selection bias that may significantly impact the generalizability of our findings. In China's hierarchical and centralized policing system, where technological modernization is a key government priority, officers who actively participate in digital communication platforms and respond to research surveys about AI technology may represent a self-selected subset of the police force who are inherently more technology-positive or organizationally compliant. Future research should prioritize more representative sampling strategies to address potential selection bias.

Fourth, several of the key measurement instruments used in this study, particularly those related to AI knowledge, training, and organizational support, were newly developed scales that have not undergone formal validation procedures. While these scales demonstrated adequate internal consistency reliability, the absence of comprehensive psychometric validation limits our confidence in their construct validity and generalizability. Future research should prioritize the systematic validation of these AI-related scales through confirmatory factor analysis, convergent and discriminant validity testing, and cross-validation across different samples and contexts. Fifth, our regression models explained only a modest portion of the variance in officers' attitudes toward police robots, indicating that most variation in officers' attitudes is attributable to factors not examined in this study. Future research should therefore consider additional variables such as personality traits, prior experiences with technology, perceptions of public opinion, AI acceptance, AI resistance, and job satisfaction to provide a more comprehensive understanding of officers' attitudes toward robotic technologies. Taken together, these limitations suggest that the findings of this study should be viewed as exploratory and informative rather than definitive.

Our findings generate several implications for policing policy and practice regarding the implementation and acceptance of AI-enabled technologies, particularly crime-fighting and service robots. When officers perceive that their organization provides adequate support for AI initiatives, they are more willing to embrace these technologies. Police departments should prioritize comprehensive training and knowledge-building programs as foundational elements of any AI technology deployment strategy. Our findings also indicate that relying solely on general leadership fairness is insufficient for enhancing police support for police robots or improving robot effectiveness. Instead, organizations must adopt more targeted strategies to deploy and sustain new technologies, since specific, technology-focused organizational support mechanisms are more critical than broader supervisory justice practices for successful AI integration in policing. Police agencies should also recognize the importance of broader organizational changes, such as inclusive planning, appropriate training, and systematic and continuous technical support, for the successful implementation of technological initiatives (Koper et al., 2015a, b).

Furthermore, the emergence of self-legitimacy as a significant predictor reveals important considerations for police identity and professional autonomy. Police executives should consider how AI technology deployment might affect officers' sense of professional competence and role clarity, ensuring that implementation strategies reinforce rather than undermine officer legitimacy. These findings collectively suggest that effective AI technology adoption in policing requires a holistic approach that addresses technical preparation, organizational support, and professional identity concerns, rather than focusing solely on technological capabilities or cost-effectiveness considerations.

Appendix 1 Survey items used to construct perceptual scales

Service robot—general support (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .93).

1. The police robot in the video undertakes some important policing tasks.
2. The police robot in the video can improve policing efficiency.
3. The police robot in the video can effectively ensure public safety.

4. Police departments should actively promote the use of this type of police robot in policing practice.
5. Police officers can trust the police robot in the video.
6. The public can trust the police robot in the video.
7. Using the police robot in the video will not infringe upon citizens' lawful rights and freedoms.

Crime-fighting robot—general support (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .95).

1. The police robot in the video undertakes some important policing tasks.
2. The police robot in the video can improve policing efficiency.
3. The police robot in the video can effectively ensure public safety.
4. Police departments should actively promote the use of this type of police robot in policing practice.
5. Police officers can trust the police robot in the video.
6. The public can trust the police robot in the video.
7. Using the police robot in the video will not infringe upon citizens' lawful rights and freedoms.

AI knowledge (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .94).

1. I have a thorough understanding of the fundamental principles of artificial intelligence technology.
2. I have a comprehensive understanding of how artificial intelligence can be used to commit crimes.
3. I have a thorough understanding of the application of artificial intelligence in crime prediction.
4. I have a thorough understanding of the use of artificial intelligence in criminal investigation and case-solving.
5. I have a thorough understanding of the role of artificial intelligence in providing legal advisory services.

AI training (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .87).

1. I have received higher-education coursework in computer science, programming, or artificial intelligence (e.g., university-level courses).
2. I have participated in specialized training in computer science, programming, or artificial intelligence (e.g., short-term coding bootcamps).
3. I have received training related to crimes involving artificial intelligence.

AI organizational support (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .92).

1. My organization provides officers with training in big data policing.
2. My supervisor frequently emphasizes the importance of digital technology in policing.
3. My supervisor praises colleagues who are proficient in various big data policing systems.

4. My supervisor supports colleagues in actively acquiring knowledge and skills in big data policing.

Supervisor justice (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .94).

1. My supervisor treats every colleague impartially and without favoritism.
2. My supervisor maintains fairness and impartiality in decision-making.
3. My supervisor shows me basic respect.
4. My supervisor invites input and suggestions from colleagues.

Occupational stress (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .84).

1. I feel extremely stressed by law enforcement work.
2. Assessments from higher authorities place immense pressure on frontline officers.
3. I feel tense while working.
4. I feel very busy at work.

Self-legitimacy (strongly disagree = 1, strongly agree = 6; Cronbach's alpha = .89).

1. Generally, police officers uphold higher ethical standards than the public.
2. Compared to the general public, police officers are more likely to comply with legal norms.
3. Becoming a police officer requires strong professional competence and good physical fitness.
4. As a police officer, I believe I play an important role in society.

Appendix 2

Service robot



Crime-fighting robot



Screenshots of the simulation videos depicting two types of humanoid robots

Author Contributions Yunan Chen played a lead role in designing the survey instrument, conducting data collection and analysis, and writing the original draft. Yuning Wu played the lead role in revising the original draft and an equal role in supervising the project. Kai Lin played a lead role in writing the review and editing the original draft. Marius Hoggenmueller and Qiuming Zhang played a lead role in designing simulation videos in the survey instrument and a supporting role in designing the survey and preparing the manuscript. Yi-Syuan (Ethan) Jian played the lead role in seeking institutional ethical approval and designing scenario questions in the survey instrument and a supporting role in writing the manuscript. Ivan Sun played a lead role in conceptualizing the paper and supervising the project and a supporting role in revising the paper.

Data Availability The study data and related files are available upon a written request to the corresponding author.

Declarations

Ethics Approval The project was approved by the Institutional Review Board of the University of Delaware (protocol # 2314174–1).

Consent to Participate Informed consent was obtained electronically via participants' acknowledgement of having read the information on the cover page before they started the survey.

Consent to Publish The authors permit the journal to publish this manuscript.

Competing interests The authors declare competing interests.

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