



Smart Interaction vs. Face-to-Face? Evidence from a Survey Experiment on Perceived Government Responsiveness in China

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Abstract

Existing research has shown that smart mobile devices have undoubtedly expedited the advancement of government services and narrowed distances in government–citizen interaction. However, a significant oversight in prior research lies in the lack of consideration of users’ perceptions regarding mobile applications, because some studies have revealed that certain mobile channels fail to offer a user-friendly experience. This study addresses this research gap by conducting a survey experiment to investigate perceived government responsiveness in both smart and human interaction modes. Drawing inspiration from customer value theory, this study argues that the perceived value of government responsiveness comprises both benefits and costs. Our experimental findings first indicate that the public significantly favors the perceived benefits of smart interaction modes over traditional human modes. More importantly, we find that the public perceives smart interaction modes as more effective in eliciting government responses for consultation and suggestions, compared to handling complaints and assistance-related issues. Regarding the perceived costs associated with seeking assistance and lodging complaints, the public exhibits skepticism towards the quality of services provided by mobile methods. In light of these findings, it is crucial for the government to allocate resources judiciously, capitalizing on the strengths of both smart and human modes of interaction, to optimize the government service ecosystem. The government must persist in refining the quality of mobile services and enhance its responsiveness to public demands during the process of government digital transformation.

Keywords Government Responsiveness · Human Interaction Mode · Smart Interaction Mode · Perceived Benefits · Perceived Costs

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Introduction

In recent years, China's efforts to transform digital government have accelerated significantly [34]. A series of digital applications, in particular mobile-based ones, have expedited the development of government services and also narrowed distances in government–citizen interaction [8, 28]. As we transition into the era of digital governance, governments are confronted with the dual pressures of accommodating diverse demands and enhancing service quality [4]. The integration of intelligent technology into government digital transformation significantly enhances capabilities. It facilitates precise decision-making and swift responses, simultaneously reshaping governance models and service paradigms [4, 25, 30]. Over the last decade, the proliferation of smart mobile devices has been astounding. In the context of government services, these devices have revolutionized information exchange. Embedded service terminals within mobile applications empower seamless, cost-effective, and highly efficient communication, transforming how governments interact with citizens [8, 26]. The perceived benefits of these mobile applications have a crucial role to play in the promotion of mobile service applications [59, 66]. The vigorous development of mobile government service applications has become a common trend among governments worldwide, with the aim of enhancing public engagement, innovating in coproduction, and alleviating governance challenges [8, 10, 39, 70]. We can observe that various mobile interaction channels, such as the 12345 hotline, government WeChat, and many service APPs, are frequently employed as platforms by the Chinese government to promptly provide services and cater to diverse demands[73].

However, some studies have found that certain mobile channels are not user-friendly[28, 41]. A significant limitation of previous studies is their neglect of users' perceptions regarding mobile applications. In the advancement of mobile government services, it is imperative to understand public users' perceptions and acceptance. Compared to traditional face-to-face human interaction mode, mobile interaction modes, which are characterized by spatial deconstruction and temporal disintegration exhibit significant differences [73]. It is not clear how public perception and selection changes as a result of differences between modes of human interaction and of smart interaction in terms of their intangibility, heterogeneity, inseparability, and perishability. Despite the convenience and efficiency offered by mobile smart government services, users often encounter technical operational challenges and communication barriers [71]. In other words, under the smart interaction mode, the public's access to government responses is also accompanied by a certain degree of cost perception. Whereas existing literature lacks a thorough examination of cost perception, we delved into government responsiveness from the perspectives of perceived benefits and perceived costs. The research presented in this study contributes to enriching the current body of knowledge in this area. Additionally, another crucial element overlooked by existing research is the diverse types of public demands. Given the diversity of demands, there will inevitably be variations in the timeliness and usefulness of government responses, as well as the fluency of communication between the government and the public

[55, 73]. Therefore, we argue that the impact of diverse types of public demands must be taken into account when evaluating government responsiveness. This remains an under-explored area in existing research.

In this study, we conduct a survey experiment to examine public perceptions of government responsiveness in human and smart interaction modes. We focus on three questions in particular. First, do different interaction modes lead to differences in public perceptions of government responsiveness in terms of convenience, usefulness, and timeliness? Second, are there differences in public perceptions of quality risk and communication risk in reference to different interaction modes? Finally, with respect to the different types of public demands, do differences exist in public perceptions of government responsiveness in smart interaction mode? We answer the first and second questions by comparing the perceived benefits and costs of government responsiveness in scenarios of face-to-face human interaction and mobile smart interaction modes. To address the third question, we categorize public demands into four types—seeking assistance, lodging complaints, consultation, and offering suggestions—following the relevant regulations and the general classification of public demands by local governments across China. Then, we study the differences in public perception of benefits and costs under different types of public demands.

Our research findings in the survey experiment indicate that smart interaction mode has a “double-edged sword” effect on the public’s perceptions of government responsiveness. The public’s perception of the convenience, usefulness, and timeliness afforded by the smart interaction mode is significantly higher than that of human interaction. However, the smart interaction mode also entails communication risks. Furthermore, differences are seen in terms of the perceived benefits and costs across different types of public demand. Our experimental design elucidates the empowering effects entailed by digital government construction. This emphasizes the necessity of promoting the development of mobile government service applications to facilitate interactions between the government and its citizens [5, 37, 50]. We must also attend to the inherent communication risks and quality hazards associated with mobile services, alongside their variability in addressing diverse public demands [56].

Theoretically, these findings enhance our understanding of government response mechanisms in the digital era. First and foremost, this study expands research on government responsiveness. We place government responsiveness within a comparative framework of smart and human interactions, an approach that significantly expands the boundaries of traditional research on government responsiveness. Our work delves into how technology alters this interactive process and its outcomes. Second, in our analysis, we verified the dimensions of benefits and costs in terms of the public’s perception, drawing on the theory of customer value. This study fills a gap in the existing research by examining the content of perceived government responsiveness. Through experimental methods, we systematically analyzed the perceived benefits and costs of government responsiveness from the perspective of the public under different interaction modes. This analysis not only deepens our understanding of the multi-dimensional nature of government responsiveness but also reveals potential new challenges brought about by technological empowerment.

While smart interactions hold significant advantages in enhancing government service efficiency and public satisfaction, they also pose potential risks. This finding serves as an important reminder for policymakers and technology developers, urging them to pay greater attention to risk prevention and ethical norms in advancing the process of digitalization. Lastly, from the perspective of user-friendliness, our study also examines how different types of public demands influence public perception, thereby adding the variable of demand types to our analysis. Our study, grounded in China, a country with a unique cultural background and social structure, provides evidence on government responsiveness from a non-Western perspective. This contributes to our understanding of the commonalities and differences in government responsiveness across different cultural and social contexts, offering a valuable addition to the theoretical construction of government responsiveness.

This analysis is significant for the promotion of mobile government applications. The unparalleled convenience of mobile applications underscores their significance. Governments must recognize and harness their empowering role, thereby enhancing public participation and government responsiveness [30, 56, 73]. At the same time, it is necessary to optimize and reasonably allocate different modes of government–citizen interaction in relation to the ecology of government services [4, 10, 37]. While mobile-based methods of government–citizen interaction have many advantages, some members of the public continue to find the experience of lodging complaints and seeking help via mobile platforms less satisfactory than face-to-face communication with government officials. The perception of quality risk is higher for assistance and complaint-related matters than those for consultation and advisory matters. Thus, the government should prioritize resolving public assistance and complaint-related issues reported through various channels, including service hotlines, government apps, and message boards. It is crucial to avoid mere formalized processing and simplistic handling, in order to ensure genuine and effective resolution of these matters [22, 70].

Literature Review and Research Hypothesis

Comparison of Government Response Under the Modes of Human Interaction and Smart Interaction

Government response can be assessed by examining the alignment between public preferences and the actual policies that are put in place by the government, representing a crucial aspect of a democratic system [2, 12, 13, 49, 58]. While classical studies propose that, in electoral democracies, governments are incentivized to respond to citizens [15], a growing body of research also indicates that authoritarian regimes exhibit internal motivation and external pressure when addressing societal demands [6, 21, 31, 36]. A growing number of scholars have found that authoritarian regimes possess both formal and informal institutions that can integrate citizen preferences into policy decisions [23, 33, 46, 53, 55]. Mertha adopted the term “fragmented authoritarianism” to characterize the political pluralism within China’s policy-making process [40]. Across the

contemporary landscape, the impediments for citizens to engage in governmental decision-making have markedly diminished, leading to a new era of heightened governmental response to public demands, with increased agility [55, 60]. This trend reflects the diversification of interaction channels between the government and the public, producing a multifaceted evolution in the dynamics of their engagement [47, 50, 73].

With the rise of mobile networks, the internet has become an integral part of people's daily lives and production processes. The emergence of mobile devices, in particular, has bridged the physical and virtual worlds, seamlessly connecting computers and mobile communications, thereby actively shaping the physical world. Baskerville et al. argue that this pervasive networked interaction is fostering value co-creation, facilitating widespread information flow, and generating a vast ecosystem of intelligent government–citizen interactions [3].

Significant differences are seen in government response between human interactions and smart interactions. Lovelock and Gummesson proposed that the characteristics of traditional manual services can be abstracted into four specific characteristics—intangibility, heterogeneity, inseparability, and perishability [32]. However, digital technology intervenes, either fully or partially, in the four fundamental dimensions of human life experience: it alters our perception of time, transforms the places we inhabit, modifies the objects we interact with, and influences the participants in our lives. For this reason, in the context of the introduction of digital technology, there are differences between traditional human service methods and smart service methods in terms of the ways that governments provide services to the public. This difference is reflected in the field of government response.

This difference in response between human and smart interaction modes is mainly manifested across four aspects (Table 1). First, in terms of intangibility, government response in human interaction modes may be more tangible and perceptible because interaction with real humans makes it easier for individuals to perceive responses as substantive, no matter whether they are verbal or written replies. By contrast, government response under smart interaction modes may be more abstract and virtual, as it could be performed by automated electronic systems, such as automatic replies to emails or the generation of standardized responses.

Second, regarding heterogeneity, government response in human interaction modes may be more personalized and flexible, as government personnel can tailor

Table 1 Comparison of Government Response under Human Interaction and Smart Interaction Modes

	Government Response in Human Interaction Mode	Government Response in Smart Interaction Mode
Intangibility	Tangible and Perceptible	Intangible and Virtual
Heterogeneity	Personalized and Flexible	Standardized and Consistent
Inseparability	Simultaneous Communication	Asynchronous Communication
Perishability	High Perishability of Information	Low Perishability of Information

their responses to specific circumstances, taking into account different individuals' needs and specific situations [73]. In the context of smart interaction, government response can be more standardized. This is because intelligent systems typically employ pre-established rules or algorithms for responses [68].

Third, for inseparability, in face-to-face human interaction, government personnel and citizens typically tend to engage in communication and interaction within the same time and space [73]. This simultaneous presence-based mode of interaction may enable government personnel to engage in face-to-face interactions to understand citizens' needs and provide immediate responses. This may facilitate emotional exchange and interpersonal communication. Government personnel can more easily perceive citizens' emotional states, thereby responding to their needs and concerns to a greater degree. In smart interaction, government responses to citizens' requests can occur at any time, without requiring government officials to be present [17, 18]. This asynchronous method of communication enables the government to handle a large volume of requests and issues more flexibly. However, due to the lack of simultaneous human presence, the public may have doubts or concerns about the government's response. This could lead to a lack of trust and understanding, potentially affecting the effectiveness of policy implementation and public satisfaction.

Fourth, with respect to perishability, the responses of government officials in human interaction may be constrained in terms of time and human resources, leading to greater perishability of information [70]. Human interaction modes typically rely on real-time communication that require government officials to respond immediately in cases where citizens raise questions or express needs. If there is a delay in response time, information perishability will increase. In smart interaction, governmental responses can be stored digitally within the system, enhancing information durability [42, 56]. Even after citizens raise questions or express needs, intelligent systems can record and retain them for future reference. Smart systems can respond to citizens' requests or questions using pre-set algorithms or rules, reducing the perishability of information [59]. Citizens can access their communication records and the government's responses in the system at any time.

Perceived Government Responsiveness and Its Constituent Elements

In line with Weber's theory of bureaucracy, the defining characteristics of bureaucracy are predominantly seen in its formal, hierarchical, and specialized structure, featuring a clear delineation of functions and jurisdiction [64, 65]. Its operations are characterized by standardization, rule-based processes, and a depersonalized approach [65]. Bureaucratic operations influence government decision-making, execution, and response to public demands. Its strict hierarchical structure mandates adherence to norms and procedures for information transfer across levels [24, 54]. This can delay information transmission, hindering the government's ability to respond swiftly to emerging issues [54].

However, in the realm of bureaucratic theory, the adoption of technology has profoundly revolutionized the dynamics of information dissemination, the intricacy of the decision-making process, the efficiency of public service delivery, and the nature

of interactions with the public, both internally within the bureaucratic structure and externally in the wider societal context [59]. This technological transformation has opened new avenues for improved communication, streamlined processes, and enhanced citizen engagement [39]. First, digitalization empowers the government to rapidly acquire, process, and disseminate information, bolstering its efficiency in identifying and resolving public demands [25]. Scholars and practitioners report that digitalization enhances adaptive governance and intelligent service delivery [48, 60]. The benefits of transparency, accountability, and openness also contribute to agile government responses [4, 52]. Second, use of technology has provided the government with additional data from which to collect public demands [1, 41], enhancing the scientific basis and precision of government decisions.

Network organizations are considered a consequence of modern functional differentiation [36], reflecting shifts in social power relations [27] and a renewed pursuit of political authority by social actors [57]. Sandoval-Almazan and Gil-Garcia found that while certain technological platforms, such as Facebook, Twitter, and blogs, offer more convenient channels of interaction, their effectiveness hinges on the government's willingness to leverage them [50]. By contrast with traditional communication channels, internet platforms have changed interaction conditions between the government and its citizens [44]. Such interactions have transitioned from offline to online, from a single channel to multiple channels [55, 75].

Mobile-based online platforms are essential tools for government online responses, which significantly impacts both public participation and governmental responsiveness [38, 51]. Mobile-based online platforms take on various forms, such as citizen service hotlines, government apps, leadership message boards, mayors' mailboxes, microblogs, and WeChat. For example, the "Swift response to public complaints" (接诉即办) reform in Beijing relies primarily on the 12345 hotline as the main channel for rapid responses to public demands. By directing public demand straight to the streets and townships and using response rate, resolution rate, and satisfaction rate as assessment indicators, governments at all levels are driven to respond promptly, handle issues quickly, and provide rapid feedback on public demands [56, 73].

How does the public perceive the process of accessing intelligent services? The theory of customer value indicates that perceived value of products consists of two core dimensions: perceived benefits and perceived costs [74]. Perceived benefits refer to the actual or anticipated advantages or value gained by consumers, while perceived costs denote the costs, risks, or sacrifices in obtaining services [74]. Evaluation of government response benefits for smart interactions primarily includes response time and rate of issue resolution [7]. Response time refers to the amount of time that the government takes to respond after receiving an inquiry or a complaint from a citizen. This includes the duration in which the government responds to citizens' messages, addresses inquiries, or provides assistance. Shorter response times are generally regarded as indicators of higher efficiency and better service quality, while longer response times may decrease citizen satisfaction with the government [7]. The rate of issue resolution refers to the proportion of issues successfully resolved by the government after responding to citizens [73]. This includes the assessment of whether the government's handling of citizen issues meets citizen

satisfaction and whether the problems are fully resolved. A high rate of issue resolution typically signifies a strong problem-solving capability and effective service level, contributing to increased trust and satisfaction among citizens with respect to the government [64, 71]. In addition, we consider that perceived convenience is one of the dimensions for evaluating the benefits of government responsiveness. Perceived convenience refers to the subjective perception and experience of the public with respect to ease of access to the services or platforms provided by the government [38]. If the government provides multiple access channels, such as mobile applications and telephone services, for citizens to access services anytime and anywhere, this enhances convenience [39]. Since the speed of response, resolution rate, and perceived ease of access highlight the potential advantages of smart government services for the public, we categorize them under perceived benefits.

In comparing between traditional human interaction and smart interaction modes, the perceived costs of government response are also topics of concern for the public [73]. On the one hand, risks regarding communication may involve issues such as whether the language used by the government in communicating with citizens is clear and understandable, whether the attitude communicated is friendly, and whether the methods of communication are appropriate [6]. If the government transmits unclear information, exhibits an indifferent attitude, or expresses a lack of respect towards citizens during communication, it can lead to concerns among citizens regarding communication [28]. On the other hand, quality concerns refer to the public's possible skepticism about the service quality that is provided by government departments on online channels, with the fear that the government may not be able to effectively address their issues or provide satisfactory services [14]. This may lead to a decrease in citizens' trust in government departments [28]. Therefore, the public's concerns regarding communication and quality risks reflect the potential costs associated with obtaining government responses. These concerns are categorized under perceived costs.

Impacts of Different Interaction Modes on Perceived Government Responsiveness

Building upon the aforementioned analysis of the comparison of perceived government responsiveness under human interaction and smart interaction modes, differences exist in the perceived benefits and costs. The public's perception of government responsiveness is determined by the characteristics of government–citizen interaction modes. Regarding intangible services, with respect to human interaction modes, human resource and time constraints may hinder the government's capacity to respond promptly or maintain consistent response quality. In contrast, smart interaction modes can achieve rapid and accurate responses by means of automated processing, thus enhancing the public's perception of government services [42]. Additionally, regarding service heterogeneity, smart interaction modes can also offer more convenient and diversified channels for the public to communicate and provide feedback [39]. Through methods such as smartphone applications and online platforms, the public can interact with the government anytime, anywhere, without limitations of time and space [42, 50]. This convenience makes the public more

inclined to choose smart interaction methods, by which they can obtain government responses more quickly [50]. To summarize, the prevalent belief among the public that smart interaction modes facilitate quicker government responses, in comparison to traditional human interactions, stems from the synergy of swift processing power, heightened efficiency, and automation inherent in intelligent technology, coupled with the accessibility offered by diverse communication channels.

In terms of the perishability of service, traditional human government–citizen interaction modes may restrict government personnel responses due to time and human resource constraints, leading to a higher perishability of information [29]. Intelligent systems can record the communication of information within the system, enhancing information durability. Even if the public raises questions, intelligent systems can record and retain them in the system for future reference, which helps reduce information perishability [39]. Moreover, intelligent systems can readily identify issues and offer data-driven and model-based solutions, providing standardized services [29]. This enhances the stability of both the processes of a service and its outcomes, improving the quality of government responses [18, 38, 39]. As a result, the public may have an advantage in perceiving the speed and efficiency of government responses [38]. Recent advancements in digital government applications, in particular in the domain of government–citizen interaction, have fundamentally transformed the ways in which government officials interact with citizens [67, 68]. Notably, dialogue terminals facilitated by mobile connections have efficiently redefined government–citizen interaction in a cost-effective way [37]. These highly convenient applications deliver on-demand online services, thereby influencing the formulation of coproduction and the allocation of service resources [8, 10, 11, 19, 39, 70]. Currently, local governments in China consider the rate of issue resolution as a significant assessment indicator for government service hotlines. They also introduced a “good/bad review” system to assess the effectiveness of government responsiveness in the handling of public demands on government apps and message boards. We observe that smart government–citizen interaction modes can increase public perceptions of the usefulness of government responses.

Regarding the inseparability of service, traditional human government–citizen interaction modes require citizens to visit convenience service halls to receive on-site services [38, 39]. The public must visit convenience service halls in person to interact with the government, which entails queuing and time costs. Smart systems can facilitate government–citizen interaction through various channels, such as hotline calls, mobile applications, websites, etc., saving communication time [75]. The public can interact with the government anytime and anywhere through intelligent systems, saving time and cost [72, 73]. Therefore, smart government–citizen interaction modes require less time investment from the public, enhancing their perception of timeliness [30].

From the above analysis, we formulate the following research hypotheses:

H1: The public perceives smart interaction modes as more convenient than human interaction modes.

H2: The public’s perception of the usefulness of government responses is higher in smart interaction modes than in human interaction modes.

H3: The public perceives that smart interaction modes enable them to obtain government responses more quickly than human interaction modes.

Regarding the perceived costs of government responsiveness, differences in quality risk and communication risk are observed across various interaction modes. First, with respect to the risk of government response quality, human interaction modes require government personnel and citizens to be present simultaneously for communication, while smart interaction modes do not [47]. In such face-to-face human interaction, the government communicates directly with the public, and government personnel provide detailed and accurate answers or solutions in response to the specific demands that the public provides [55]. By contrast, smart interaction, conducted in virtual spaces, due to the absence of immediacy, particularly when dealing with complex issues or involving emotional support [28], may trigger greater concerns regarding the certainty of outcomes, leading to higher concerns with respect to government response quality [8, 50]. Moreover, in many cases, online government responses do not necessarily indicate that the government has effectively addressed public demands [41].

Second, with respect to the perception of communication risks, government personnel can better understand the public's needs and opinions and provide timely feedback and solutions through direct interpersonal communication on-site [73]. Convenience service halls are still an important means for citizens to express their demands. Interpersonal communication can more effectively convey emotions and information, and traditional human interaction modes typically offer higher communication quality. This is particularly beneficial for citizens who prefer face-to-face communication and may be unfamiliar with using smart mobile devices [8, 47]. By contrast, interactions between the government and the public in virtual spaces may result in relatively lower communication quality due to the lack of emotional support and personalized communication [29]. In addition, hidden dangers such as privacy leaks, data abuse, and online fraud also undermine the public's trust in cyberspace [20, 66]. Therefore, the virtual nature of cyberspace and the absence of physical government presence may heighten the public's perception of the risks associated with obtaining government response information.

From this analysis, this paper proposes the following research hypotheses:

H4: Smart interaction modes lead to higher perceived risks of government response quality than human interaction modes.

H5: Smart interaction modes may increase the perceived risks of communication relative to human interaction modes.

The relationships among the relevant research hypotheses are illustrated in Fig. 1.

Influence of Different Types of Demands on Perceived Government Responsiveness

Public demands vary in terms of their urgency, steps required for processing, and complexity of procedures. There are therefore differences in terms of the public's

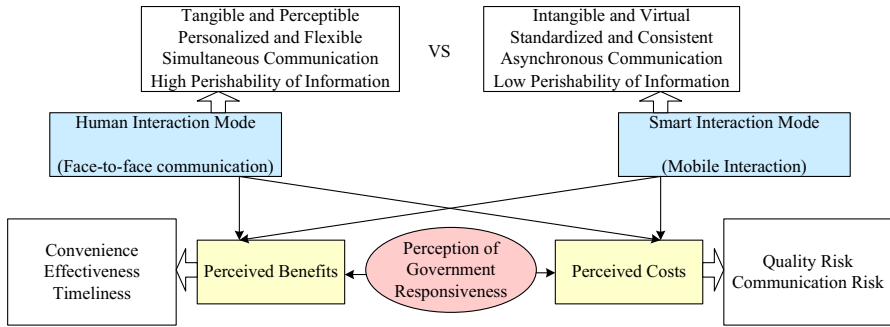


Fig. 1 Conceptual Framework of this Study

perception of how different demands are handled [10, 55]. With respect to the general categorization of public demands that are handled by the 12345 hotline across local governments in China, we classify the demands raised by the public into the following four categories: seeking assistance, complaint, consultation, and suggestion [55]. Requests for assistance from the public refer to instances where individuals seek government help and support during difficulties, emergencies, or unexpected events. These requests can encompass a broad spectrum of concerns, particularly those pertaining to personal and community safety, health matters, economic hardships, and a myriad of other issues [69]. Illustrative examples are requests for disaster relief, urgent medical assistance in emergency situations, and support for those facing unemployment. Public complaints encompass grievances or dissatisfaction directed towards government administrative agencies, public service institutions, or public affairs [75]. This can include issues related to service quality, administrative impropriety, corruption, and other concerns, such as dissatisfaction with public service quality or unfair administrative enforcement. Consultation-type complaints refer to inquiries made by the public to the government regarding policies, laws, regulations, administrative procedures, and other matters to obtain information or clarification. These inquiries often involve issues related to personal rights, social welfare, and government policies. For instance, they could include questions about tax policies, social security regulations, and similar topics. Suggestions and appeals by the public refer to instances where individuals, based on their experiences, perspectives, or opinions, offer recommendations or proposals to the government. These suggestions aim to improve public policies, enhance the quality of public services, or address social issues [39]. This is a proactive way of participating in social affairs [10, 39, 70].

With respect to perceived convenience, although human and smart government–citizen interaction modes provide channels for seeking assistance, lodging complaints, seeking consultation, and offering suggestions, mobile-based platforms may perform better [30, 56]. This is because the public can use these to send requests for assistance anytime, anywhere via their mobile phones and without the need to visit service halls [71]. Whether it’s an inquiry or a complaint, the public is not restricted by traditional office hours and locations, greatly enhancing the

convenience of handling matters[73]. In the operation of intelligent systems, the sophisticated question-answering mechanism leverages advanced natural language processing and machine learning algorithms to autonomously interpret users' queries and furnish apt responses. In contrast, requests for assistance and complaints frequently require intricate handling procedures. These procedures involve several steps, such as categorizing the issues, conducting thorough investigations and verifications, and engaging in complex communication and coordination efforts. Consulting and advisory services underscore interactivity and participation, thereby enabling the public to engage more directly in government affairs through smart interaction modes. On the contrary, requests for assistance and complaints tend to prioritize resolving specific issues, often with a lesser emphasis on interactivity and public participation. These factors collectively contribute to heightening the public's recognition of the convenience of government's responsive consulting and suggestion services.

In smart interaction modes, consultations and suggestions typically involve straightforward and clear information. The answers or recommendations the public seeks are usually direct and specific. As a result, this type of interaction is more likely to be perceived by users as useful and efficient [28, 41]. Therefore, when responding to these consultations and suggestions, the government can provide relevant information and recommendations more clearly and quickly, thereby enhancing the public's perception of the usefulness of government responsiveness [8]. However, seeking assistance and filing complaints often involve more complex and urgent issues, and the public may experience heightened emotions and pressure when making these appeals [73]. These demands not only require a rapid government response but also involve the coordination and resolution of issues across multiple departments and levels, thereby increasing the difficulty and complexity of the response [55]. Therefore, the public may have doubts about the effectiveness of the government's response to requests for assistance and complaints. They might believe that there could be delays or deficiencies in communication, coordination, and provision of solutions during the handling process, which can negatively impact their overall perception of government responsiveness [30, 56].

In smart interaction modes, consultations and suggestions can significantly enhance the public's perception of the timeliness of government responses. Firstly, consultations and suggestions often involve more direct and clear questions, allowing smart interaction systems to understand and respond swiftly [41]. Additionally, the government often prepares preset response templates or sets up automated processes for common consultation and suggestion questions [7]. These mechanisms enable smart interaction systems to quickly generate standardized responses, reduce waiting times, and enhance the public's perception of the timeliness of government responses[55]. Conversely, requests for assistance often involve unexpected events or emergency situations, such as disaster relief or health emergencies. However, smart interaction systems may be constrained by technology and human resources when dealing with such emergencies, resulting in delays and an inability to provide immediate and effective support. This can lead to a public perception of slower response times [8]. Complaints often involve complex coordination and communication between multiple departments or institutions. While smart interaction systems

can provide preliminary information and guidance, handling complex complaints usually requires manual intervention and detailed solution development. This can lead to the public perceiving the government's response as not timely or thorough enough [47]. Furthermore, requests for assistance and complaints often elicit emotional responses from the public, including anxiety and anger. Handling these situations poses a significant challenge for smart interaction systems, as they struggle to effectively comprehend and address these emotional needs. And many times the automation systems lack the capacity to respond empathetically and efficiently [28, 70]. This difficulty may further impact the public's perception and satisfaction with the timeliness of government responses.

From the above analysis, the following research hypotheses are proposed:

H6: In smart interaction modes, the public's perception of the convenience of government responses to consultations and suggestions is significantly enhanced.

H7: In smart interaction modes, the public's perception of the usefulness of government responses to consultations and suggestions is significantly enhanced.

H8: In smart interaction modes, the public's perception of the timeliness of government responses to consultations and suggestions is significantly enhanced.

In smart interaction modes, the public's perception of the quality risk associated with responses to requests for assistance and complaints may be elevated. Seeking assistance typically involves urgent or critical issues. While smart systems can respond promptly, the lack of human empathy or the inability to directly resolve complex problems may lead the public to question the quality of the response [28]. Complaints frequently arise due to dissatisfaction with either services or products. Nonetheless, in the realm of intelligent interaction, a notable absence of adequate human connection and personalized service handling can be observed. Additionally, the system might encounter challenges in comprehensively understanding and resolving the intricate details of a complaint, ultimately leading to delayed responses on mobile platforms. This situation may lead the public to harbor grievances about the quality of services provided by government departments online [43, 55]. Some government officials, pressured by performance evaluations [76], may opt for superficial responses rather than addressing underlying issues [17, 35, 55, 56]. Besides, due to the algorithmic black box problem in intelligent government services, it may exacerbate public risk concerns [19, 23]. In contrast, consulting appeals do not involve direct conflicts of interest or dissatisfaction, so the public's expectations for response quality are generally lower. For suggestion-based appeals, although adopting and implementing suggestions may be time-consuming, the public's expectations for the response quality are typically more forgiving, as these suggestions do not involve direct personal interests [56].

The public is typically sensitive to the perception of communication risks when the government handles requests for assistance and complaints. Due to the urgent and significant personal or social issues involved in assistance and complaints, the public expects the government to uphold transparency in the communication process [19]. The public may be concerned about the government's communication challenges or lack of transparency when handling complaints and seeking assistance

through intelligent methods, potentially heightening communication risks [47]. Additionally, the algorithm's black box nature conceals the operational process from the user, which may obscure potential issues such as algorithmic discrimination and unfairness that remain invisible to users [19, 25]. This may lead to user distrust of the intelligent system. Matters related to consultation and suggestions are primarily regulated by established rules, ensuring that intelligent services adhere to rigorous standardization in their handling of such issues. From this perspective, the communication risk associated with requests for assistance and complaints is somewhat higher in smart interaction modes.

From these considerations, the following research hypotheses are proposed:

H9: In smart interaction modes, the public's perception of the quality risk of government responses to assistance and complaints is significantly enhanced.

H10: In smart interaction modes, the public's perception of the communication risk of government responses to assistance and complaints is significantly enhanced.

Research Design

Survey Experiment Design

Survey experiments can provide direct evidence of causal relationships and have unique advantages as a research method for analyzing public attitudes, behaviors, and preferences regarding specific issues [20, 45, 61]. Survey experiments can control for other potential variables, ensuring high internal validity. Additionally, their large random samples make the results more statistically representative [45].

This study designed a survey experiment with a 2 (interaction mode: human and smart) \times 4 (request type: seeking assistance, filing complaints, consultation, and suggestions) factorial design (see Table 2). To enhance the representativeness of the public demands in the experimental scenario, we conducted research based on use of the 12345 hotline in Jinan City, China. We selected the most frequent public demands from 2019 to 2021 and applied appropriate privacy protection measures to them. In the experimental scenario, seeking assistance is exemplified by citizens reporting indoor heating issues, complaint is represented by disturbances caused by nighttime construction, consultation is illustrated by inquiries about housing purchase restriction policies, and suggestion is depicted by recommendations for infrastructure maintenance. Then, we embedded these four types of demands into different modes of government–citizen interaction, resulting in eight experimental scenarios (see Appendix 1).

In the period from March to April 2024, we collected data via the Credamo online survey platform. Survey questionnaires were distributed through the built-in randomization function of the platform. To ensure participants' understanding of the textual descriptions of the experimental scenarios, we required participants to be aged 18 years or older. To ensure the validity of the questionnaires and the attentiveness of the respondents, we designed two confirmatory questions. The first was "Have

Table 2 Survey Experiment Design of this Study

	<i>Human interaction mode</i>	<i>Smart interaction mode</i>
<i>Seeking assistance</i>	Seeking assistance to resolve indoor heating issues + Convenience service hall	Seeking assistance to resolve indoor heating issues + Service hotline, government app, message board on mobile phone
<i>Complaint</i>	Filing complaint about nighttime construction noise + Convenience service hall	Filing complaint about nighttime construction noise + Service hotline, government app, message board on mobile phone
<i>Consultation</i>	Consulting about housing purchase restriction policies + Convenience service hall	Consulting about housing purchase restriction policies + Service hotline, government app, message board on mobile phone
<i>Suggestion</i>	Suggesting the installation of bridge railings + Convenience service hall	Suggesting the installation of bridge railings + Service hotline, government app, message board on mobile phone

you heard of the government service app?" (Heard of it / Not heard of it). The second question was "Have you used the government service app?" (Heard of it, used it / Heard of it, haven't used it / Not heard of it, haven't used it). Respondents who answered "Heard of it" to the first question but "Not heard of it, haven't used it" for the second and those who chose "Not heard of it" for the first question but selected either "Heard of it, used it" or "Heard of it, haven't used it" for the second were considered to have failed the attention test. Additionally, we also designed a question: The scenario described above concerns "_____" (indoor heating issues, nighttime construction noise, housing purchase restriction policies, infrastructure maintenance). Time controls were implemented for the reading materials and answering questions.

Variable Measurement

To measure the perceived convenience, this study provides item descriptions with variations across experimental scenarios. These include "Do you find it convenient to seek assistance in solving indoor heating issues at the convenience service hall?" and "Do you find it convenient to seek assistance in solving indoor heating issues through smartphone channels?" The items are measured using a 5-point Likert scale.

To measure the perceived effectiveness, this study employs items measured on a 5-point Likert scale. These include "Do you believe that filing a complaint about nighttime construction noise at the convenience service hall can effectively address your concerns?" and "Do you believe that filing a complaint about nighttime construction noise through smartphone channels can effectively address your concerns?"

To measure the perceived timeliness, this study includes the items: "Do you feel that consulting about housing purchase restriction policies at the convenience service hall will promptly elicit a government response?" and "Do you feel that consulting about housing purchase restriction policies through smartphone channels will promptly elicit a government response?" These items are measured using a 5-point Likert scale.

To measure the perceived quality risk, the items in the "Complaints + Human" scenario is as follows: "When you file a complaint about nighttime construction noises at the convenience service hall, do you hold a skeptical attitude towards the quality of services provided by government departments?" For the "Complaints + Smart" scenario, the item is: "When you file a complaint about nighttime construction noises through smartphone channels, do you hold a skeptical attitude towards the quality of services provided by government departments?" These items are measured using a 5-point Likert scale.

To assess the perceived communication risk, the items include: "When seeking assistance for indoor heating issues at the convenience service hall, do you worry that government departments may not fully understand the issues you express?" and "When seeking assistance for indoor heating issues through smartphone channels, do you worry that government departments may not fully understand the issues you express?" These items are measured using a 5-point Likert scale.

The study recorded the demographic variables of gender, age, education level, economic income, and political affiliation of respondents.

Sample and Balance Test

We kept to relevant ethical research standards and informed respondents that their responses would be kept anonymous and confidential. The survey sample was representative across geographical regions and age groups (see Table 3). A total of 1,000 respondents participated in this survey, with 843 passing the attention check. Of these, 67.73% were female. The age distribution was concentrated in the 18–30 group (46.74%) and the 31–40 group (41.52%). The majority of participants possessed a bachelor's degree, accounting for 66.90% of the total. Subsequently, a significant proportion held a postgraduate degree or higher qualifications, making up 15.42% of the participants.

For the experimental scenario allocation, there were 104 participants in the “Human+Seeking assistance,” 107 in the “Smart+Seeking assistance,” 105 in the “Human+Filing Complaint,” 105 in the “Smart+Filing Complaint,” 104 in the “Human+Consultation,” 107 in the “Smart+Consultation,” 105 in the “Human+Suggestion,” and 106 in the “Smart+Suggestion” scenario groups.

Random allocation of participants is paramount to the research validity of survey experiments. This study employed the “Credamo” online survey platform, equipped with various experimental scenario designs, to distribute questionnaires and conduct

Table 3 Sample Description

		N	Percent (%)
<i>Gender</i>	Female	571	67.73
	Male	272	32.27
<i>Age (years)</i>	18–30	394	46.74
	31–40	350	41.52
	41–50	58	6.88
	≥ 51	41	4.86
<i>Political affiliation</i>	Not a member of the Communist Party of China	674	79.95
	Member of the Communist Party of China (including probationary members)	169	20.05
<i>Educational level</i>	High school and below	35	4.15
	Vocational school	13	1.54
	Junior college	101	11.98
	Bachelor's degree	564	66.90
	Postgraduate and above	130	15.42
<i>Monthly income (yuan)</i>	≤ 3000	124	14.71
	3001–5000	145	17.20
	5001–10000	320	37.96
	≥ 10,001	254	29.66

Table 4 Balance Test

	Group1	Group2	Group3	Group4	Group5	Group6	Group7	Group8	F	P
<i>Gender</i>	0.28	0.32	0.46	0.32	0.25	0.34	0.30	0.30	1.807	0.083
<i>Age (years)</i>	1.84	1.67	1.62	1.70	1.72	1.58	1.76	1.73	0.997	0.432
<i>Political affiliation</i>	0.21	0.18	0.16	0.15	0.17	0.19	0.25	0.29	1.394	0.204
<i>Educational level</i>	4.93	4.78	4.84	4.80	4.88	5.00	4.88	4.89	0.745	0.634
<i>Monthly income (yuan)</i>	2.98	2.85	2.68	2.80	2.85	2.99	3.01	2.95	1.161	0.323

Note: Group1: Seeking assistance + human interaction; Group2: Seeking assistance + smart interaction; Group3: Filing complaint + human interaction; Group4: Filing complaint + smart interaction; Group5: Consultation + human interaction; Group6: Consultation + smart interaction; Group7: Suggestion + human interaction; Group8: Suggestion + smart interaction

random assignment. To verify the successful implementation of random assignment, we conducted a balance test using One-way ANOVA from variance analysis and the subsequent LSD multiple comparison method. Table 4 presents the results of the balance test, revealing that there are no significant differences ($P > 0.05$) in the mean values of covariates across the eight experimental groups. This confirms the successful randomization of participants into the eight groups.

The sample size of around 100 in each group is sufficiently large according to the sample size requirements for survey experiment research [45]. Indeed, the use of "overpowered experiments" in psychology and medicine is concerning [20]. In such cases, large sample sizes can result in statistically significant differences, even for small or scientifically nonsignificant effects [20]. This can increase the risk of type I errors and potentially lead to erroneous policy implications [45]. As Mutz notes, if experimental political science insists on maximizing sample sizes without critical consideration while adhering to traditional significance levels, this may produce conclusions that lack substantive practical policy implications [45]. We reaffirmed the robustness of our research conclusions in later robustness test by designing questionnaires for different experimental scenarios.

Findings

We used analysis of variance (ANOVA) to test the main effects of interaction mode on perceived benefits and costs (see Table 5). The results indicate that, compared to the human interaction mode, the participants perceived higher levels of convenience ($F(1,841) = 131.645$; $P < 0.001$), usefulness ($F(1,841) = 5.176$; $P = 0.023$), and timeliness ($F(1,841) = 5.704$; $P = 0.017$) in the smart interaction mode. These differences were statistically significant. This suggests that the participants believed that the utilization of smart interaction mode would yield a significantly greater degree of benefits, in comparison to the traditional human interaction mode. This result supports Hypotheses 1, 2, and 3.

This finding underscores the potential benefits of the smart interaction mode in enhancing government responsiveness. The smart interaction mode offers more efficient services through leveraging automation and rapid data processing, enhancing convenience, usefulness, and timeliness [73]. This trend fits harmoniously within the wider scope of the digital transformation initiative, wherein governmental entities

Table 5 Effects of Interaction Mode on Various Dimensions of Perceived Benefits and Costs

Variables	Human interaction	Smart interaction	<i>P</i> value
Perceived convenience	3.75 (1.101)	4.47 (0.672)	$F(1,841) = 131.645$; $P < 0.001$
Perceived usefulness	3.85 (0.930)	3.99 (0.841)	$F(1,841) = 5.176$; $P = 0.023$
Perceived timeliness	3.63 (0.959)	3.78 (0.888)	$F(1,841) = 5.704$; $P = 0.017$
Perceived quality risk	2.49 (1.018)	2.47 (1.059)	$F(1,841) = 0.044$; $P = 0.833$
Perceived communication risk	2.58 (1.248)	2.68 (1.259)	$F(1,841) = 1.242$; $P = 0.265$

are progressively embracing intelligent technologies to elevate service standards, cater to public expectations, and propel forward their digital transformation endeavors [43]. Mobile interaction channels exhibit unique characteristics and capabilities, including the seamless delivery of services, facilitating real-time communication and instant feedback, enabling online participation in decision-making processes, ensuring transparency through information disclosure, as well as facilitating data collection and analysis [30, 56]. An overview of mobile government services in China's provinces and municipalities, notably "Jie Su Ji Ban (接诉即办)" in Beijing, "Zhe Li Ban (浙里办)" in Zhejiang, and "One Net for All (一网通管)" in Shanghai, underscores their popularity among the public due to user-friendly interfaces, simplified operations, and swift responses. These smart applications empower citizens with seamless access to vital information and the ability to manage relevant services anytime, anywhere, fostering convenience and efficiency.

The participants perceived slightly lower levels of quality risk ($F(1,841)=0.044$; $P=0.833$) but slightly higher levels of communication risk ($F(1,841)=1.242$; $P=0.265$) in the smart interaction mode than in the human interaction mode. However, neither difference was statistically significant. This finding may reflect participants' higher level of trust in the smart interaction mode. Although the smart interaction mode poses potential risks, including concerns over data security and privacy, participants may not perceive these threats as more salient or evident than those inherent in human interaction modes. This could be attributed to the continuous progress and improvement in smart technologies and the implementation of relevant regulations and security measures, which have to some extent alleviated the public's concerns regarding smart interaction modes [25]. This discovery further underscores the fact that, despite respondents harboring concerns over technical risks, they tend to favor the adoption of smart applications, particularly when they perceive them as being highly beneficial. This revelation is of paramount importance for the ever-evolving domain of artificial intelligence in the realm of public services [42, 77].

This finding indicates that governments and relevant organizations should consider public perceptions when promoting smart interaction modes. It is crucial to take active measures to alleviate public concerns and to strengthen the regulation and management of smart technologies to ensure their safety and reliability [37, 78]. Simultaneously, there is a need to continually improve the efficiency and quality of the human interaction mode to meet the needs and expectations of the public [73].

Further, we examined whether the type of demands significantly moderates the relationship between the interaction mode and the perceived government responsiveness. Figure 2 illustrates this effect more directly. Figure 2b indicates that when the dependent variable is perceived usefulness, in the smart interaction mode, consultation and suggestion matters are more effective in enhancing the public's perceived usefulness relative to seeking assistance and filing complaints. Thus, Hypothesis 7 is validated. This difference may reflect the fact that consultation and suggestion matters are more likely to receive useful responses in smart interaction. Consultation and suggestion matters typically involve providing information or offering suggestions, which can be more easily processed and responded to by smart systems. Therefore, they can meet the needs of the public more effectively and enhance the

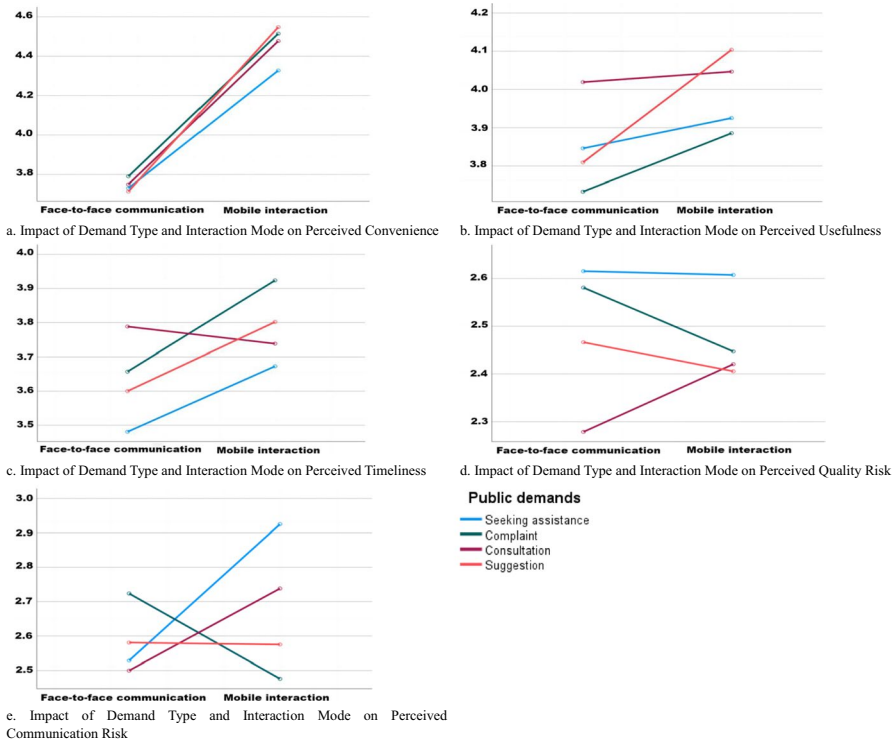


Fig. 2 Impact of Demand Type and Interaction Mode on Perceived Benefits/Costs (a) Impact of Demand Type and Interaction Mode on Perceived Convenience (b) Impact of Demand Type and Interaction Mode on Perceived Usefulness (c) Impact of Demand Type and Interaction Mode on Perceived Timeliness (d) Impact of Demand Type and Interaction Mode on Perceived Quality Risk (e) Impact of Demand Type and Interaction Mode on Perceived Communication Risk

perceived usefulness of the smart service. On the contrary, the process of seeking assistance and filing complaints often encompasses more personal matters, for which the public may interpret a smart response as unsatisfactory or lacking in adequacy. This could lower the perceived usefulness of the smart service. This insight underscores the significance of government departments adeptly managing public inquiries and suggestions within the framework of intelligent interaction models. Efforts should be made to improve their efficiency and quality to meet the public’s needs and enhance their perceived usefulness of the smart service. In addition, attention should also be paid to addressing issues around seeking assistance and filing complaints, actively resolving the public’s issues and complaints to enhance public satisfaction and trust.

With respect to perceived costs, from Fig. 2d, it can be observed that when the dependent variable is perceived quality risk, in the human interaction mode seeking assistance and filing complaints are more effective in increasing the public’s concern with respect to quality risk relative to consultation and suggestions. Besides, in the smart interaction mode, seeking assistance and filing complaints matters are more

effective for enhancing the public's quality concerns relative to consultation and suggestion matters. Thus, Hypothesis 9 is validated. This observation sheds light on the divergence in quality risk perception, reflecting diverse levels of focus on service quality, particularly when comparing assistance-seeking and complaint filing with consultative and suggestive matters across various interaction modes. On the one hand, seeking assistance and filing complaints, which frequently encompass urgent or substantial issues, are more potent in eliciting public quality concerns. This phenomenon stems from the public's supervision of the government's handling and response quality, and the fact that the public is more likely to worry about the handling of these issues. On the other hand, in the context of smart interaction, we observed a similar trend, such that seeking assistance and filing complaints tended to heighten public concerns with respect to the quality of response. This might stem from the fact that, in the context of smart interaction, the government might provide superficial responses, whereas the public's primary concern lies in whether the government has indeed addressed and resolved the problem. Even if some requests for assistance and complaints are replied to by the relevant government departments online, the issue may not have been resolved; it could just be a transfer of responsibility or an online record of work completion. This finding suggests that government departments must prioritize the handling of requests for assistance and complaints to improve the quality of the government's responses, ensuring timely, accurate, and effective responses to public needs.

According to the experimental results, Hypothesis 1, Hypothesis 2, Hypothesis 3, Hypothesis 7, and Hypothesis 9 have been validated. Hypothesis 4, Hypothesis 5, and Hypothesis 10 have not been validated in terms of perceived costs. One reason for this could be that, given the novelty of mobile government services, some members of the public may not be fully cognizant of the potential risks involved. Their attention tends to gravitate towards the convenience and functionality of the services, overshadowing considerations such as risk mitigation and data security. On the other hand, mobile government services are frequently endorsed and administered by government departments, fostering a high level of trust among the public. This trust frequently prompts the public to presume stringent government measures will safeguard service security and integrity, alleviating concerns over potential risks. Additionally, when utilizing mobile government services, the public often balances risks against benefits; if perceived advantages from convenience vastly outweigh potential losses from risks, they are more inclined to accept those risks.

Hypothesis 6 and Hypothesis 8 have not been validated in terms of perceived benefits. The reason may be that smart service platforms typically integrate multiple functions, facilitating the handling of various types of matters for the public. Whether it's an inquiry, suggestion, request for assistance, or complaint, users can operate through the same interface and process [55]. In conclusion, since the public can handle both inquiries and suggestions as well as requests for assistance and complaints through smart service platforms, which provide a unified channel, 24/7 accessibility, and standardized processing procedures, the perceived convenience and timeliness for different types of demands is nearly indistinguishable.

Robustness Test

To test the robustness of the survey results, we designed an additional experiment (see Appendix 2). For the assistance scenario, we opted for seeking help in resolving employment challenges. As for the complaint scenario, we chose the voicing of dissatisfaction regarding the absence of soundproof walls installed in residential areas adjacent to railway tracks. For the consultation scenario, we selected inquiring about online contract signing procedures. Finally, for the suggestion scenario, we proposed that relevant authorities should rigorously enforce the prohibition on parking vehicles in fire escape lanes.

We designed 8 experimental scenarios based on 2 (interaction mode: human and smart) \times 4 (request type: seeking assistance, filing complaints, consultation, and suggestion). The procedure is similar to the experiment described above. Among the 804 valid responses, females were 67.20%. The age distribution was primarily concentrated in the 18–30 age group (45.40%) and the 31–40 age group (41.40%). For educational qualifications, the most common level of educational qualification was a bachelor's degree (11.30%).

There were 100 participants in the “Human + Seeking assistance” group, 100 in the “Smart + Seeking assistance” group, 98 in the “Human + Complaint” group, 102 in the “Smart + Complaint” group, 100 in the “Human + Consultation” group, 100 in the “Smart + Consultation” group, 101 in the “Human + Suggestion” group, and 103 in the “Smart + Suggestion” group. The chi-square test indicated that there were no significant differences among groups in terms of control variables, indicating that the experimental scenarios were randomly assigned.

The ANOVA results indicated that in terms of perceived benefit, participants perceived greater convenience, usefulness, and timeliness in smart interaction mode relative to human interaction mode. For the perceived costs, the participants did not perceive significant differences in quality risk or communication risk between the two interaction modes (see Table 6).

Additionally, as shown in Fig. 3, for smart interaction mode, the impact of consultation and suggestion on the public's perception of the usefulness of government response is stronger than that demands of seeking assistance and complaints. The impact of the complaint and seeking assistance demand types on the public's perception of the quality risk of government response is stronger than that for consultation and suggestion.

Table 6 Impact of Interaction Mode on Various Dimensions of Perceived Benefits/Costs

Variables	Human interaction	Smart interaction	<i>P</i> value
Perceived convenience	3.89 (0.990)	4.52 (0.611)	F (1,802) = 127.038; P < 0.001
Perceived usefulness	3.79 (0.972)	3.93 (0.766)	F (1,802) = 6.371; P = 0.020
Perceived timeliness	3.64 (0.891)	3.89 (0.814)	F (1,802) = 15.328; P < 0.001
Perceived quality risk	2.54 (1.050)	2.46 (1.039)	F (1,802) = 1.538; P = 0.252
Perceived communication risk	2.70 (1.244)	2.73 (1.289)	F (1,802) = 0.217; P = 0.691

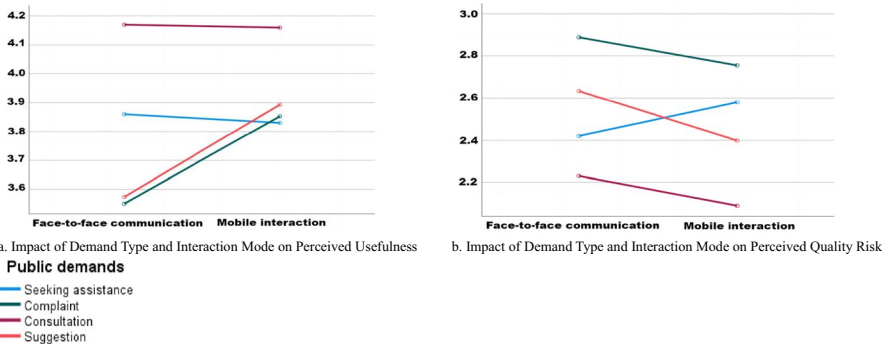


Fig. 3 Impact of Demand Type and Interaction Mode on Perceived Benefits/Costs in Robustness Test (a) Impact of Demand Type and Interaction Mode on Perceived Usefulness (b) Impact of Demand Type and Interaction Mode on Perceived Quality Risk

The above results demonstrate the robustness of the experimental findings.

Conclusions

In the era of digital governance, both academics and practitioners show a high level of interest in smart government services. However, with respect to promoting smart government services, there has been little research attention on the public's perception of such services. The application of technology is a double-edged sword, and public perceptions of the value brought by smart interaction include both benefits and costs. Therefore, leveraging survey experiments as the research method, this study explores the public's perceptions of government responsiveness under two interaction modes: human interaction and smart interaction. The findings reveal the primary dimensions and crucial variables shaping public perceptions, offering incontrovertible evidence that provides a deeper understanding of the public's stance towards smart interaction modes.

Firstly, among the contributions of this study lies the assertion, grounded in customer value theory, that the perceived value of government responsiveness encompasses two fundamental and pivotal elements: perceived benefits and perceived costs. This framing provides a nuanced understanding of how citizens evaluate government responsiveness, enriching the discourse within the field. Among these, perceived benefits encompass the convenience, effectiveness, and timeliness of the government responses. Additionally, perceived costs consist of risks pertaining to quality and communication during the supply of services.

Secondly, this study significantly contributes to the literature by introducing four analytical dimensions—intangibility, heterogeneity, inseparability, and perishability—for comparing human interaction modes with smart interaction modes. This framework offers a comprehensive and nuanced approach to examining the differences between these two modes, enriching the theoretical discourse and providing practical insights for policymakers and practitioners. The integration of digital

technology into the government-citizen interactions has transformed the nature of traditional manual services. Consequently, previous analytical frameworks have become inadequate in comprehending service provisions within the context of technological integration. We argue that in the context of both human and smart interaction modes, the disparities in the government's responses in terms of intangibility, heterogeneity, inseparability, and perishability result in variations in the public's perceived benefits and perceived costs. This study finds that the public's perception of the benefits of smart interaction mode are significantly higher than human interaction mode. This finding reinforces previous research, indicating that the utilization of technology in government-citizen interactions augments the transparency, convenience, and accessibility of government responses [18, 56, 75].

Thirdly, this study's contribution extends to the necessity of considering diverse types of public demands when assessing government responsiveness. This perspective underscores the importance of tailoring government responsiveness strategies to meet the varying needs of different segments of the population, thereby enhancing the inclusivity and effectiveness of public services. In smart interaction modes, different types of demands affect the public's perception of government responsiveness. The public perceives that smart interaction modes are more useful in eliciting government responses for consultation and suggestion matters than complaint and assistance-related issues. With respect to the perceived costs related to seeking assistance and complaints, the public holds a skeptical attitude towards the quality of services provided by government agencies. This skepticism stems from the government's inefficient handling of assistance and complaint matters, leading to sub-optimal service responses and a subsequent decline in public satisfaction with the provided services.

The research findings for this study could be influenced by the sample characteristics. The study was conducted through an online survey, which might have led to a sample population that has higher digital literacy than the average population, leading to a greater acceptance of mobile government services. However, the research findings indicate that the government's robust initiatives to foster mobile government services have yielded certain interim successes.

Implications

Digital government technologies are widely used to enhance levels of interaction, participation, and collaboration. Government sectors employ digital government technologies to enhance their interaction with citizens [18]. Recent research has advocated for a digital governance perspective to comprehend the role that technologies play in the dynamic interaction between governments and their citizens, as well as in shaping government responsiveness. Our research examines the perceived benefits and costs of government responsiveness in the smart interaction and human interaction modes. The main insights of this study are summarized in the following three points:

First, the government should pay attention to user-friendly smart applications. Featuring enhanced convenience and accessibility, mobile channels afford citizens

increased opportunities to access government responses [9, 64]. It is worth noting that various local governments in China are currently promoting rapid response mechanisms for public demands, primarily through mobile platforms, with the aim of facilitating rapid responses to and feedback on public demands [41, 55]. However, a unilateral emphasis on the technological efficiency of intelligent government services may raise questions with respect to service quality. In the pursuit of advancing mobile government services, it is crucial to refrain from hasty or uniform advancements that disregard individual needs. Alternatively, focus should be directed towards significantly elevating the quality of mobile government services. Crucial steps include bolstering information transparency and accountability in the implementation of mobile government services, fostering public awareness and comprehension of the intelligent service process, and embracing digital inclusivity to transform intelligent services in order to better satisfy public demands [10, 60].

Second, based on the optimization of the government service ecosystem, it is essential to rationally allocate services across different interaction modes [63]. While mobile-based interaction modes offer numerous advantages, granting platforms for timely and convenient interaction anytime and anywhere, some members of the public may find the experience of lodging complaints or seeking assistance through mobile platforms less satisfactory than face-to-face communication with government officials [55]. Therefore, it is imperative to allocate resources judiciously, taking into account the strengths of both online and offline modes of interaction. Online methods of interaction can enhance the convenience and efficiency of services, saving time and costs, while offline methods of interaction can provide more personalized and considerate service experiences, enhancing the warmth and trustworthiness of interactions [56, 73]. In recent years, despite the widespread adoption of e-government platforms significantly enhancing the efficiency of administrative work and public services, certain localities have encountered challenges such as the overdevelopment of work application software, redundant data reporting, and excessive "traceability", all of which have imposed undue burdens at the grassroots level. Therefore, as we embrace digital empowerment through "key-to-key" interactions, it is imperative that we maintain "face-to-face" engagement with the public and ensure that digitization does not become a barrier between the government and its citizens.

Third, in the supply of digital services, the government should pay attention to public satisfaction. It is imperative to vigilantly monitor public requests and complaints communicated via service hotlines, government apps, and messaging platforms, aiming to elevate both the resolution rate and citizens' satisfaction levels. Through a rigorous analysis of public feedback and satisfaction metrics, the government should adapt its service strategies dynamically, steering clear of overly formalistic or simplistic responses, thus ensuring a consistent improvement in service quality [62].

Research Limitations

Our study has significant implications for understanding the effects of government–citizen interaction modes on perceived government responsiveness, and it is imperative

to acknowledge these limitations. First, regarding theoretical development, while this study examines the public's perception of government responsiveness through two distinct interaction modes, it falls short of delving into the underlying mechanisms that underpin these perceptions. Furthermore, it is acknowledged that smart interaction modes can elicit diverse impacts on the public, contingent upon varying degrees of digital literacy [16]. Future research endeavors could build upon this foundation by broadening the surveyed demographic to comprehensively explore the influence of digital literacy on these perceptions. Second, in terms of research design, drawing upon the demands expressed through hotlines during our preliminary research, we crafted scenario-based case studies. While survey experiment methods can emulate real-world situations to a certain extent, they inevitably fall short of fully replicating the intricacies and diversity of the actual world. Consequently, the generalization of our research findings to broader contexts may encounter limitations. Besides, we overlooked factors such as automated trustworthiness and accessibility. Encouragingly, recent research has embarked on addressing issues pertaining to automated trustworthiness [19], and we aspire to delve into this matter in our subsequent studies.

Appendix 1. Survey Experiment Design.

Seeking Assistance

The heating in your home is not sufficient, with the room temperature hovering around 13 degrees Celsius, falling short of the standard. You have repeatedly reported this issue to the property management staff, but the problem remains unresolved. Your residential area is serviced by municipal heating, yet you are unsure which heating company provides the service. Your goal is to resolve the heating issue.

⊙ Your neighborhood has a convenient service hall in the local street, where on-site staff handle related matters.

⊙ You can voice your concerns and report the problem through various digital channels, including the citizen service hotline, government affairs mobile apps, and online message boards on your mobile phone.

Filing a Complaint

The construction site opposite your residential community has been causing noise pollution after 22:00 every day, severely disrupting the rest of the residents. It is hoped that relevant departments could help address and resolve this issue.

⊙ The street where you reside has a convenient service hall with on-site staff available to handle related matters.

⊙ You can report this problem through various digital channels on your mobile phone, such as the citizen service hotline, government affairs apps, and online message boards.

Consultation

Recently, you have plans to purchase a property and wish to inquire about the purchase restriction policies in your city. Specifically, you would like to know if purchasing one house within a district falls outside the scope of purchase restrictions, whereas acquiring two houses in the same district would be subject to such restrictions.

◎The street where you reside has a convenient service hall staffed with personnel who can provide consultations on related matters.

◎You can consult about these services via various digital platforms on your mobile phone, including the citizen service hotline, government affairs apps, and online message boards.

Suggestion

During your commute to work, you observed that a bridge in the vicinity lacked railings. You wish to suggest the installation of railings to ensure the safety of pedestrians crossing the bridge and hope that the relevant authorities will take action to address this issue.

◎The street where you reside has a convenient service hall that welcomes on-site submissions of citizens' suggestions on social governance.

◎You can submit your suggestions through various digital channels on your mobile phone, including the citizen service hotline, government affairs apps, and online message boards.

Appendix 2. Survey Experiment Design in the Robustness Test.

Seeking Assistance

Your contract with your former employer has expired, yet the company has been withholding your Second-Class Registered Constructor Certificate and Safety Officer B Certificate. Additionally, these certificates have not been cancelled in the system, hindering your normal employment prospects. Despite having secured a new job offer, you are unable to commence work due to this situation. Currently, the human resources and social security department has investigated and penalized the company, but the company has chosen to accept the punishment rather than return your certificates.

◎The street where you reside has a convenient service hall staffed with personnel who can assist with related matters.

◎You can report this issue through various digital channels on your mobile phone, such as the citizen service hotline, government affairs apps, and online message boards.

Filing a Complaint

As a homeowner in the XX residential community, you were informed by the developer, who belongs to the BL Group, prior to delivery of your property that a sound-proof wall would be installed alongside the railway to the north of the community. However, to date, no such installation has taken place. You express the hope that this issue will be addressed and resolved by the relevant authorities.

⊙The street where you reside has a convenient service hall staffed with personnel who can handle such matters on-site.

⊙You can report this issue through various digital channels on your mobile phone, including the citizen service hotline, government affairs apps, and online message boards.

Consultation

You are intending to proceed with the online signing of a commercial housing contract in the near future and are inquiring about the necessary materials that need to be brought along for this process.

⊙The street where you reside has a convenient service hall with on-site staff who can provide consultation for related business matters.

⊙You can consult about this and other related services via digital channels on your mobile phone, including the citizen service hotline, government affairs apps, and online message boards.

Suggestion

You have observed that the sole lane connecting your area to the main road is severely obstructed by illegally parked vehicles, and currently remains unmanaged. As a result, only a single car can navigate through this lane, posing a significant safety hazard. It is crucial to note that this lane is intended to serve as a fire escape route, yet visually, it appears to be impassable for fire trucks. You express the hope that the relevant authorities will strictly prohibit vehicle parking on this section of the road and work towards increasing the number of access roads and public parking facilities in the area.

⊙The street where you reside boasts a convenient service hall that welcomes in-person submissions of citizens' suggestions related to social governance.

⊙You have the option to submit your suggestions via digital channels on your mobile phone, including the citizen service hotline, government affairs apps, and online message boards.

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Declarations

Conflict of Interest We declare that we have no conflicts of interest with regard to this work submitted.

References

1. Alegre, J., and R. Chiva. 2008. Assessing the impact of organizational learning capability on product innovation performance: An empirical test. *Technovation* 28 (6): 315–326.
2. Andersen, S.A., and T.R. Burns. 1996. The European union and the erosion of parliamentary democracy: A study of post-parliamentary governance. *Contemporary Developmental Analysis* 1 (2): 33–66.
3. Baskerville, R.L., M.D. Myers, and Y. Yoo. 2019. Digital first: The ontological reversal and new challenges for IS research. *MIS Quarterly* 44 (2): 509–523.
4. Bertot, J., E. Estevez, and T. Janowski. 2016. Universal and contextualized public services: Digital public service innovation framework. *Government Information Quarterly* 33 (2): 211–222.
5. Charron, N., and V. Lapuente. 2011. Which dictators produce quality of government? *Studies of Comparative International Development* 46 (4): 397–423.
6. Chen, J. D., and Y. Q. Xu. 2014. Authoritarian governance with public communication. In *Annual Conference of the Midwest Political Science Association*. Chicago.
7. Chen, J.D., J. Pan, and Y.Q. Xu. 2016. Sources of authoritarian responsiveness: A field experiment in China. *American Journal of Political Science* 60 (2): 383–400.
8. Clark, B.J., J.L. Brudney, S.G. Jang, and B. Davy. 2020. Do advanced information technologies produce equitable government responses in coproduction: An examination of 311 systems in 15 US cities. *American Review of Public Administration* 50 (3): 315–327.
9. Clark, B.Y., and T.S. Guzman. 2017. Does technologically enabled citizen participation lead to budget adjustment? An investigation of Boston, MA, and San Francisco, CA. *American Review of Public Administration* 47 (8): 945–961.
10. Clark, B.Y., J.L. Brudney, and S.G. Jang. 2013. Coproduction of government services and the new information technology: Investigating the distributional biases. *Public Administration Review* 73 (5): 687–701.
11. Coulthart, S., and R. Riccucci. 2022. Putting big data to work in government: The case of the United States border patrol. *Public Administration Review* 82 (2): 280–289.
12. Curley, C., P.S. Federman, and R. Shen. 2022. Expanding the political market framework to explain executive decision-making during the COVID-19 crisis. *Public Administration Review* 83 (5): 1281–1299.
13. Dahl, R. 1971. *Polyarchy: Opposition and participation*. New Haven: Yale University Press.
14. Edmond, C. 2013. Information, manipulation, coordination, and regime change. *Review of Economic Studies* 80 (4): 1422–1458.
15. Finkel, S.E. 1985. Reciprocal effects of participation and political efficacy: A panel analysis. *American Journal of Political Science* 29 (4): 891–913.
16. Fourcade, M. 2021. Ordinal citizenship. *The British Journal of Sociology* 72 (2): 154–173.
17. Gauld, R., A. Gray, and S. McComb. 2009. How responsive is E-government? Evidence from Australia and New Zealand. *Government Information Quarterly* 26 (1): 69–74.
18. Gil-Garcia, J.R., S.S. Dawes, and T.A. Pardo. 2018. Digital government and public management research: Finding the crossroads. *Public Management Review* 20 (5): 633–646.
19. Grimmelikhuijsen, S. 2023. Explaining why the computer says no: algorithmic transparency affects the perceived trustworthiness of automated decision-making. *Public Administration Review* 83 (2): 241–262.
20. Gu, Y., and B. Zheng. 2023. The double-edged sword of state media credibility: Experimental evidence from China. *Journal of Chinese Political Science*. <https://doi.org/10.1007/s11366-023-09877-9>.
21. Han, R. 2023. Debating China beyond the Great Firewall: Digital disenchantment and authoritarian resilience. *Journal of Chinese Political Science* 28 (1): 85–103.
22. Hu, D., E. Wang, Q. Ye, S. Chen, and X. Gu. 2023. How do online public messages affect local government responsiveness in China? A multilevel analysis based on the message board for leaders. *Journal of Chinese Political Science*. <https://doi.org/10.1007/s11366-023-09866-y>.
23. Huang, Z.B., Z.S. Yang, and T.G. Meng. 2023. National identity of locality: The state, patriotism, and nationalism in cyber China. *Journal of Chinese Political Science* 28 (1): 51–83.
24. Hull, M. S. 2012. Documents and bureaucracy. *Annual Review of Anthropology* 41 (1): 251–267.

25. Janssen, M., M. Hartog, and G. Kuk. 2020. Will algorithms blind people? The effect of explainable AI and decision-makers' experience on AI-supported decision-making in government. *Social Science Computer Review* 40 (2): 478–493.
26. Ju, J.R., T.G. Meng, F.F. Sun, L.N. Liu, and S. Sing. 2023. Citizen preferences and government chatbot social characteristics: Evidence from a discrete choice experiment. *Government Information Quarterly* 40 (3): 101785.
27. Kettl, D.F. 1996. Governing at the millennium. In *Handbook of public administration*, ed. J.L. Perry, 5–18. San Francisco, CA: Jossey-Bass.
28. Kreps, S., and M. Jakesch. 2023. Can AI communication tools increase legislative responsiveness and trust in democratic institutions? *Government Information Quarterly* 40 (3): 101829.
29. Lember, V., T. Brandsen, and P. Tönurist. 2019. The potential impacts of digital technologies on co-production and co-creation. *Public Management Review* 21 (11): 1665–1686.
30. Lemmer, K., K. Jahn, A. Chen, and B. Niehaves. 2023. One tool to rule?—A field experimental longitudinal study on the costs and benefits of mobile device usage in public agencies. *Government Information Quarterly* 40 (3): 101836.
31. Lorentzen, P. 2014. China's strategic censorship. *American Journal of Political Science* 58 (2): 402–414.
32. Lovelock, C., and E. Gummesson. 2004. Whither services marketing? In search of a new paradigm and fresh perspectives. *Journal of service research* 7 (1): 20–41.
33. Magaloni, B. 2008. Credible power-sharing and the longevity of authoritarian rule. *Comparative Political Studies* 41 (4–5): 715–741.
34. Mahoney, J.G. 2023. China's rise as an advanced technological society and the rise of digital orientalism. *Journal of Chinese Political Science* 28 (1): 1–24.
35. Malesky, E., and P. Schuler. 2012. Nodding or needling: Analyzing delegate responsiveness in an authoritarian parliament. *American Political Science Review* 104 (3): 482–502.
36. Mayntz, R. 1997. *Soziale Dynamik und politische Steuerung: Theoretische und methodologische Überlegungen*. New York: Campus Verlag.
37. Mehr, H. 2017. *Artificial intelligence for citizen services and government*. Cambridge, MA: Harvard Kennedy School.
38. Meijer, A. 2015. E-governance innovation: Barriers and strategies. *Government Information Quarterly* 32 (2): 198–206.
39. Meijer, A.J. 2011. Networked coproduction of public services in virtual communities: From a government-centric to a community approach to public service support. *Public Administration Review* 71 (4): 598–607.
40. Mertha, A. 2009. “Fragmented authoritarianism 2.0”: Political pluralization in the Chinese policy process. *The China Quarterly* 200: 995–1012.
41. Minard, P. 2015. Does ICT diffusion increase government responsiveness in autocracies? An empirical assessment of the political implications of China's internet. *Journal of Contemporary China* 24 (96): 1048–1069.
42. Moon, M.J. 2023. Searching for inclusive artificial intelligence for social good: Participatory governance and policy recommendations for making AI more inclusive and benign for society. *Public Administration Review* 83 (6): 1496–1505.
43. Mossberger, K., Y. Wu, and J. Crawford. 2013. Connecting citizens and local governments? Social media and interactivity in major U.S. cities. *Government Information Quarterly* 30 (4): 351–358.
44. Müller, M. 2022. Spreading the word? European union agencies and social media attention. *Government Information Quarterly* 39 (2): 101682.
45. Mutz, D.C. 2021. Improving experimental treatments in political science. In *Advances in experimental political science*, ed. J. Druckman and D. Green, 219–238. Cambridge: Cambridge University Press.
46. Nathan, A. 2003. Authoritarian resilience. *Journal of Democracy* 14 (1): 6–17.
47. Nisar, M.A. 2018. Children of a lesser God: Administrative burden and social equity in citizen-state interactions. *Journal of Public Administration Research and Theory* 28 (1): 104–119.
48. Ojo, A., and S. Mellouli. 2016. Deploying governance networks for societal challenges. *Government Information Quarterly* 35 (4): S106–S112.
49. Powell, G.B. 2000. *Elections as instruments of democracy: Majoritarian and proportional visions*. New Haven, CT: Yale University Press.

50. Sandoval-Almazan, R., and J.R. Gil-Garcia. 2012. Are government internet portals evolving towards more interaction, participation and collaboration? Revisiting the rhetoric of e-government among municipalities. *Government Information Quarterly* 29 (1): 72–81.
51. Scholta, H., and I. Lindgren. 2023. Proactivity in digital public service: A conceptual analysis. *Government Information Quarterly* 40 (3): 101832.
52. Scupola, A., and A. Zanfei. 2016. Governance and innovation in public sector services: The case of the digital library. *Government Information Quarterly* 33 (2): 237–249.
53. Shirk, S. 2010. *Changing media, changing China*. New York, NY: Oxford University Press.
54. Sjoberg, F.M., J. Mellon, and T. Peixoto. 2017. The effect of bureaucratic responsiveness on citizen participation. *Public Administration Review* 77 (3): 340–351.
55. Su, Z., and T.G. Meng. 2016. Selective responsiveness: Online public demands and government responsiveness in authoritarian China. *Social Science Research* 59: 52–67.
56. Tang, T., J.H. Hou, D.L. Fay, and C. Annis. 2021. Revisit the drivers and barriers to e-governance in the mobile age: A case study on the adoption of city management mobile apps for smart urban governance. *Journal of Urban Affairs* 43 (4): 563–585.
57. Thornton, P.M. 2011. Retrofitting the steel frame: From mobilizing the masses to surveying the public. In *Mao's Invisible hand: The political foundations of adaptive governance in China*, ed. S. Heilmann and E. Perry, 237–268. Cambridge, MA: Harvard University Press.
58. Verba, S., and N.H. Nie. 1972. *Participation in America: Political democracy and social equality*. Chicago: University of Chicago Press.
59. Vogl, T.M., C. Seidelin, B. Ganesh, and J. Bright. 2020. Smart technology and the emergence of algorithmic bureaucracy: Artificial intelligence in UK Local authorities. *Public Administration Review* 80 (6): 946–961.
60. Wang, C.C., R. Medaglia, and L. Zheng. 2018. Towards a typology of adaptive governance in the digital government context: The role of decision-making and accountability. *Government Information Quarterly* 35 (2): 306–322.
61. Wang, Y., and H. Pan. 2024. Information collection, public attitudes, and supportive behavior tendencies in the urban digital transformation: A survey experiment in a facial recognition scenario. *Journal of Chinese Governance*. <https://doi.org/10.1080/23812346.2024.2378395>.
62. Wang, Y., and R. Han. 2023. Cosmetic responsiveness: Why and how local authorities respond to mundane online complaints in China. *Journal of Chinese Political Science* 28 (2): 187–207.
63. Wang, Z.Y., S.Y. Woo, and D. Kübler. 2024. The emerging big data ecosystem and digital transformation of poverty governance in China. *Social Sciences in China* 45 (2): 152–183.
64. Weber, L.M., A. Loumakis, and J. Bergman. 2003. Who participates and why? An analysis of citizens on the internet and the mass public. *Social Science Computer Review* 21 (1): 26–42.
65. Weber, M. 1970. *Politics as a Vocation*. In *From Max Weber: Essays in sociology*, ed. H. H. Gerth and C. Wright Mills, 77–128. London: Routledge and Kegan Paul.
66. Willems, J., L. Schmidhuber, D. Vogel, F. Ebinger, and D. Vanderelst. 2022. Ethics of robotized public services: The role of robot design and its actions. *Government Information Quarterly* 39 (2): 101683.
67. Wirtz, B., and W. Müller. 2019. An integrated artificial intelligence framework for public management. *Public Management Review* 21 (7): 1076–1100.
68. Wirtz, B., J. Weyerer, and C. Geyerer. 2019. Artificial intelligence and the public sector-applications and challenges. *International Journal of Public Administration* 42 (7): 596–615.
69. Xie, C., L. Huang, and Y. Li. 2024. Evaluating the coordinated development between digital technology and local safety management capability: Evidence from 31 provinces in China. *Journal of Chinese Governance*. <https://doi.org/10.1080/23812346.2024.2389495>.
70. Xu, C. K., and T. Tang. 2020. Closing the gap or widening the divide: the impact of technology-enabled coproduction on equity in public service delivery. *Public Administration Review* 80 (6): 962–975.
71. Yigitcanlar, T., R. Li, P.B. Beeramoole, and A. Paz. 2023. Artificial intelligence in local government services: Public perceptions from Australia and Hong Kong. *Government Information Quarterly* 40 (3): 101833.

72. Young, M.M., J.B. Bullock, and J.D. Lecy. 2019. Artificial discretion as a tool of governance: A framework for understanding the impact of artificial intelligence on public administration. *Perspectives on Public Management and Governance* 2 (4): 301–313.
73. Yuan, C.H., and Y.J. Wu. 2020. Mobile instant messaging or face-to-face? Group interactions in cooperative simulations. *Computers in Human Behavior* 113: 106508.
74. Zeithaml, V.A. 1988. Consumer Perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing* 52 (3): 2–22.
75. Zhao, S., and R. Wahid. 2024. Dear Leader!: A look at (In) directness in online complaints in China. *Journal of Pragmatics Research* 6 (1): 17–37.
76. Zhong, P., and Y. Zeng. 2024. Does top-down accountability promote responsiveness? Evidence from a survey experiment in China. *Journal of Chinese Governance* 9 (1): 1–22.
77. Zou, Y.H. 2024. Urban resilience, digital technologies, and the economic recovery of a city from the pandemic. *Public Administration Review* 84 (4): 637–650.
78. Zouridis, S., M. Eck, and M. Bovens. 2020. Automated discretion. In *Discretion and the quest for controlled freedom*, ed. T. Evans and P. Hupe, 313–329. Cham: Palgrave Macmillan.

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