

## Overcoming inertia for sustainable urban development

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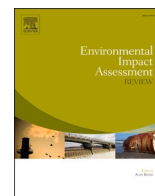
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# Overcoming inertia for sustainable urban development: Understanding the role of stimuli in shaping residents' participation behaviors in neighborhood regeneration projects in China

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## ABSTRACT

Neighborhood regeneration has become essential component of environmental improvement, and promoting resident participation is a key aspect of effective environmental management. However, in China, the legacy of the former housing allocation system and specific cultural contexts have led to residents' psychological inertia towards participating in neighborhood regeneration. Although there has been extensive research on encouraging resident participation, most studies fail to recognize that cultivating active participation behavior among residents usually requires overcoming their existing reluctance or psychological inertia first. Grounded on the innovative notion of psychological inertia, this paper puts forth the perspective that to foster resident participation, it is imperative to initially disrupt their current participation inertia and subsequently facilitate the reconfiguration of their participation behavior. Specifically, it addresses two key research questions: (i) which factors are conducive to stimulating residents to overcome inherent psychological inertia and stimulate their positive participation attitudes? (ii) How do these stimuli shape and reconstruct residents' participation behavior? Based on the Stimulus-Organism-Response (SOR) theory and structural equation modeling (SEM), this paper unveils the mask of intrinsic mechanism for overcoming psychological inertia and reshaping residents' participation behavior. The empirical results show that three stimulating factors (information acquisition, social norms, and perceived grassroots government support) directly impact residents' participating attitudes; these stimuli reconstruct participation behavior by triggering individual psychological changes and then inducing behavioral changes. With the new insight of "overcoming psychological inertia" and the incorporation of behavioral psychology in restructuring resident participation behavior, this paper presents implementation strategies for promoting resident participation in neighborhood regeneration.

## 1. Introduction

Neighborhood regeneration, the process of physical and economic regeneration of dilapidated neighborhoods, is a sound approach to dealing with community decay, enhancing citizens' well-being, and ameliorating the urban environment (Zheng et al., 2014). Global trends in neighborhood regeneration are well documented, with a plethora of contributions showcasing how regeneration projects align with the new agenda for sustainable urban development (Huang et al., 2020). In

China, approximately 160,000 dilapidated neighborhoods cover an area of 800 million m<sup>2</sup>, impacting over 42 million families (Liu et al., 2022). The primary focus of neighborhood regeneration in China is the rehabilitation of building conditions, optimization of community organization and management structures, and enhancement of environmental quality in public spaces (General Office of the State Council (GOSC), 2020). Residents can participate in the decision-making process by attending meetings and discussions, and voting on proposals (Huang et al., 2023c). Encouraging resident participation in these projects is

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crucial to enhance the democratic nature, increase responsiveness to residents' needs and interests, and foster community collaboration and development (Chen and Qu, 2020; Kim et al., 2020). Therefore, promoting active resident participation in neighborhood regeneration projects is a fundamental component of urban development strategies.

In China, the government has introduced various policy measures to encourage wider resident participation. For instance, several municipal policies stipulate that the consent of the majority of residents (i.e., two-thirds or more residents) is required before implementing a neighborhood regeneration project (The People's Government of Guangzhou Municipality (PGGM), 2020; The People's Government of Shantou Municipality (PGSM), 2014). However, these measures have not achieved the expected widespread participation of residents, with resident participation in public affairs still criticized as "showcase participation" in China (Cao, 2022). The apathetic attitude and passive participation behavior of residents pose significant obstacles to the smooth implementation of neighborhood regeneration (Guo, 2020). Despite numerous efforts, the anticipated improvement in the effectiveness of resident participation through relevant incentive policies has not been realized.

One potential explanation for the ineffectiveness of these policy interventions could be attributed to a failure to essentially stimulate residents' participation willingness due to the ignorance of the inertia effect. While there is a wealth of research on promoting resident participation in neighborhood regeneration (Li et al., 2020; Lu, 2020), most studies fail to recognize that cultivating active participation behavior among residents typically necessitates first overcoming their existing psychological inertia. The origin of this psychological inertia can be traced back to the early housing allocation system in China, known as the danwei system (Feng and Chen, 2019). Under this system, housing units were assigned to individuals based on their employment, leaving little room for residents to engage in decision-making or housing management. As a result, a culture of passive acceptance developed, with little incentive for residents to take an active role in shaping their living conditions (MacLachlan and Gong, 2023). Although the danwei system has been largely phased out, its influence may persist, creating psychological inertia that discourages community participation (Feng and Chen, 2019). This psychological inertia manifests in several ways. First, due to the perception that active participation lacks value, residents may not pay attention to relevant information about neighborhood regeneration, which can result in a serious obstruction to residents' information acquisition (Jia et al., 2021). Second, established social norms among community residents (e.g., retired employees of a same enterprise) may reinforce attitudes and behaviors that discourage participation in neighborhood public affairs, leading to a "silent majority" (Huang et al., 2023a; Li et al., 2022). Third, grassroots governments may prioritize administrative efficiency over residents' participation in decision-making, which may lead to a lack of grassroots government support for residents in need of professional assistance for participating in the neighborhood regeneration. Therefore, to incentivize active participation in neighborhood regeneration projects, it is crucial to address these challenges and stimulate a fundamental shift in established psychological inertia.

In the realm of psychology, the concept of psychological inertia refers to the tendency of human behavior to stick to familiar patterns, representing resistance to change (Gao et al., 2020). Without external stimuli, psychological inertia will persist, resulting in slow and barely noticeable shifts (Zarate et al., 2019). Psychological research has shown that if a stable-context is destabilized then the causal links between context-cues and existing psychological inertia are severed, temporarily, provide an opportunity to break old psychological inertia altogether and form new behavioral pattern (Haggar et al., 2019). This may provide a feasible path for fundamentally promoting residents' participation in neighborhood regeneration, as the process of neighborhood regeneration significantly diverges from prior urban development models, such as new construction and demolition and reconstruction, leading to a

destabilization of the existing stable context. Under such circumstances, effective stimuli may potentially disrupt the pre-existing psychological inertia of residents reluctance to participate, paving the way for the development of new patterns of behavior that reflect active participation. The Stimulus-Organism-Response (SOR) theory can offer a valuable theoretical framework for analyzing the process of overcoming psychological inertia and then reshaping participation behavior. This theory suggests that external stimuli (S) can trigger changes in the individual's internal psychological inertia (O), subsequently resulting in changes in the individual's behavioral response (R) (Mehrabian and Russell, 1974). The SOR theory has been widely applied across diverse fields, including online purchasing, urban planning, virtual reality tourism (Chan et al., 2017; Elzeni et al., 2022; Talwar et al., 2022), and it has been proven to be an effective tool for understanding how stimuli guide and shape human behavior. Additionally, the SOR paradigm provides a valuable framework for comprehending how various stimuli can affect an individual's internal responses and behaviors regarding participation in different contexts (Song et al., 2022; Yang et al., 2021). Despite an abundance of existing literature, there remains a gap in research utilizing the SOR theory to analyze the stimulation of active participation among residents in neighborhood regeneration projects.

Therefore, based on the aforementioned background, this study poses two research questions:

- Which factors are conducive to stimulating residents to overcome inherent psychological inertia and stimulate their positive participation attitudes?
- How do these stimuli shape and reconstruct residents' participation behavior?

To answer the aforementioned research questions, this study sets out to identify the stimuli that have the potential to induce changes in psychological inertia and promote resident participation in the Chinese context. Subsequently, the research hypotheses are proposed based on the Stimulus-Organism-Response (SOR) model. A total of 381 valid questionnaires were collected through a questionnaire survey, and structural equation modeling (SEM) was utilized to unveil the inherent mechanism of residents' participation behavior. Finally, the study draws policy implications based on the findings in relation to the issues of resident participation in neighborhood regeneration in China.

This study makes two significant contributions to the literature on resident participation in neighborhood regeneration. Firstly, this paper dives into the practical problem from a new insight of "overcoming psychological inertia". In some instances of practical strategy formulations and participatory research, there is a pervasive assumption that residents consistently possess a wholly positive inclination towards participation and will readily engage once presented with the opportunity. However, this biased perception overlooks the occurrence of inert participation behavior induced by the psychological inertia effect. Consequently, it impedes the identification of stimuli that truly foster behavioral change among residents and curtails the efficacy of motivational measures. This study adopts the perspective of "overcoming psychological inertia" and offers a redefined interpretation of resident participation behavior, highlighting the critical importance of addressing and surmounting their psychological inertia as a prerequisite for motivating their active involvement in neighborhood regeneration efforts. Moreover, considering the dynamic nature of behavioral evolution, where different time periods may exhibit varying levels of participation inertia, this innovative perspective can also provide a new strategy for future urban sustainable development, namely identifying psychological inertia and then finding out corresponding stimuli to guide resident behavior. Secondly, this paper innovatively incorporates behavioral psychology in restructuring resident participation behavior in neighborhood regeneration. The change in participation behavior is rooted in the cognitive shift (attitude change) triggered by external stimuli. Therefore, it is crucial and necessary to integrate the research

framework of behavioral psychology into the study of resident participation behavior in neighborhood regeneration. By utilizing the SOR theory, this study comprehensively investigates the intrinsic mechanisms involved in overcoming psychological inertia and reshaping resident participation behavior. It facilitates an exploration of how stimuli shape residents' participation attitudes and behaviors, elucidating the intricate interrelationships among these factors. This framework provides new analytical tools and opens up new avenues for investigating and understanding resident participation behavior.

The rest of the paper is organized as follows. Section 2 conducts a comprehensive literature review and Section 3 puts forward the theoretical basis and research hypothesis. The data collection and methodology applied in this paper are presented in detail in Section 4. Section 5 presents the results, and a discussion follows it in Section 6. Finally, section 7 summarizes the whole study.

## 2. Literature review

Neighborhood regeneration is an essential component of urban regeneration, and its evolving meaning is closely linked to the process of urbanization (Zhu et al., 2019). Initially, large-scale demolition and reconstruction dominate regeneration activities due to the tremendous economic benefits generated by the land rent gap. In this stage, elite coalitions comprising government officials and developers held significant influence over decision-making, with residents largely excluded from the process (Zhang, 2014). Issues such as social conflicts, gentrification, cultural erosion, and spatial justice provoked intense academic discourse (Hin and Xin, 2011). With the gradual increase of the urbanization rate in China, the growth of the urban population and the improvement of citizens' expectations for living conditions have jointly created a great demand for high-quality urban development. Unbridled urban expansion and extensive redevelopment sparked scholarly reflection and critique (Hin and Xin, 2011; Zhang, 2014). In this context, neighborhood regeneration, which emphasizes small-scale regeneration of dilapidated neighborhoods, is promoted to support sustainable urban development. As direct stakeholders and end-users, residents play a crucial role in determining the success or failure of neighborhood regeneration projects (Zheng et al., 2023). Therefore, encouraging resident participation in neighborhood regeneration has become increasingly important (Chen and Qu, 2020).

Although promoting resident participation is a consensus, it does not mean that the residents can always participate well in neighborhood regeneration projects (Liu et al., 2021a, 2021b). Several empirical investigations have revealed that residents, as limited rational actors, have a propensity to maximize short-term gains for themselves and shirk their responsibilities towards collective efforts, thus exhibiting little inclination to actively partake in neighborhood regeneration undertakings, particularly those related to public affairs (Tang et al., 2022; Wu and Xiong, 2022). Previous research has provided valuable insights and recommendations on promoting residents' participation in public affairs (Li et al., 2020; Lu, 2020). However, most existing studies have failed to take into account the unique characteristic of residents' psychological inertia towards participation. Consequently, previous research has primarily focused on the fundamental logic of "whether or not to participate" (Gu et al., 2022; Lin et al., 2022), rather than exploring "the transitional relationship between old and new participation patterns". Specifically, the former can be regarded as a direct portrayal of the ideal resident participation state, which implies an important premise that, given the opportunity, residents would actively and openly participate in the decision-making process of neighborhood regeneration (Dai et al., 2022). The latter, on the other hand, advocates that the new and improved resident participation pattern was based on overcoming the inherent psychological inertia, which involves two critical steps: overcoming inherent psychological inertia and reconstructing new positive participation behavior. This represents a fundamental departure from simply describing the ideal resident participation state.

However, it is difficult to spontaneously generate a change in inherent psychological inertia, and external environmental stimuli are required to promote such changes (Yang et al., 2021). The SOR theory can provide a theoretical framework for the analysis of overcoming psychological inertia and behavior change (Talwar et al., 2022). It explains how external stimuli, internal evaluation, and resulting behavior changes are connected. For instance, in the research field of online purchasing, the SOR theory is used to understand how consumers respond to different stimuli such as websites, marketing, or situational stimulus (Chan et al., 2017). Elzeni et al. (2022) applied the SOR theory to identify urban morphology factors affecting pedestrians and to find pedestrian responses to each stimulus. Moreover, the SOR theory has also been used in the field of virtual reality tourism to explore what stimuli can motivate people to switch from traditional to virtual travel behavior in a pandemic context (Talwar et al., 2022). Notably, the selection of stimulus factors differs across various fields due to different research preferences (Chan et al., 2017; Elzeni et al., 2022; Talwar et al., 2022). Although SOR theory has been widely used in studies on inertia overcoming and behavior changing in various fields, to the best of the author's knowledge, there is a current research gap in exploring resident participation behavior in the context of neighborhood regeneration and urban sustainable development using the SOR theory. Therefore, it is essential to investigate the factors that can stimulate residents' participation in neighborhood regeneration projects to fill this gap.

Previous studies on the factors influencing residents' participation behavior may provide references for the study of stimulus factors and it can be summed into two categories: individual factors and external environmental factors. In terms of individual factors, previous studies have explored the role of perception, attitudes, intentions, satisfaction, socio-demographic characteristics, etc. (Huang et al., 2023a; Sun et al., 2022; Tang et al., 2022). In terms of external environmental factors, previous research has mainly focused on the effect of social interaction, social norms, public trust, governmental incentives on residents' participation behaviors (Li et al., 2022; Liu et al., 2021a, 2021b; Wu and Xiong, 2022). However, few research on stimulating residents' participation behavior from both individual and external environmental perspectives. Hauge et al. (2013) identified the essential elements for the participation and consent of housing cooperative residents at the social, organizational, and individual levels for sustainable energy efficiency regeneration. Wu and Xiong (2022) demonstrate the significant positive effects of utilizing information- and incentive-based tools on citizen co-production behavior in both in-role and extra-role capacities. Nonetheless, as far as the authors are aware, there has been no research examining how individual and external environmental factors can stimulate residents' participation behavior in the context of neighborhood regeneration.

In summary, while previous studies have contributed to the understanding of resident participation in neighborhood regeneration, there is a need to further explore the potential impact of deep-rooted psychological inertia on participation in the Chinese context. The SOR theory presents a theoretical framework that has been widely utilized in research on behavior change and overcoming psychological inertia, but its application in the field of neighborhood regeneration and sustainable urban development remains limited. Therefore, there is a lack of knowledge on effective factors for changing psychological inertia and promoting resident participation behaviors in this context.

## 3. Theoretical basis and hypotheses development

### 3.1. The stimulus-organism-response (SOR) theory

The SOR theory was first developed by Mehrabian and Russell (1974) and consisted of three components, as shown in Fig. 1. It suggests that sudden changes in the external environment can be perceived as stimuli (S) that lead to changes in the individual's internal state (O) thereby fostering changes in the individual's behavioral response (R)



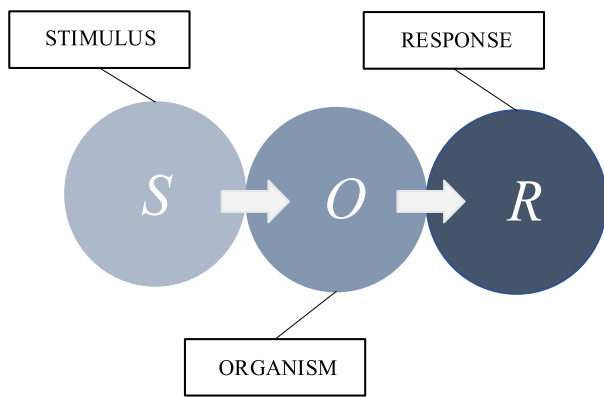


Fig. 1. “Stimulus-Organism-Response”(SOR) theory.

(Mehrabian and Russell, 1974). By definition, stimuli (S) are “outside forces that influence the psychological and cognitive state of an individual” (Ying et al., 2022). The term “organism”(O) reflects an individual’s cognition or perception, reflecting the psychological process caused by external environment stimulation (Pal et al., 2020). Response (R) is the behavior taken by the individual after a series of cognitive, perceptual, and mental activities (Song et al., 2022). According to the theory, stimuli from the environment (S) are perceived and interpreted by individuals (O) through their internal cognitive and emotional processes. These internal processes then lead to certain behavioral responses (R). In other words, This theory posits that behavior is not directly caused by stimuli. Indeed, the internal state changes of an organism (individual) are a prerequisite for the external stimuli to induce response (behavior) alterations. In this study, the SOR theory forms the theoretical basis for exploring how to overcome inertia and stimulate the resident participation in the neighborhood regeneration projects.

3.2. Hypotheses development based on the SOR theory

As outlined in Section 3.1, the SOR theory comprises three fundamental components, namely stimulus, organism, and response. In this study, we consider information acquisition (IA), social norms (SN), and perceived grassroots government support (PGGS) as stimuli in the context of neighborhood regeneration. Additionally, residents’ attitudes (ATT) towards participation in neighborhood regeneration projects are regarded as the organism, while residents’ participation behavior (PB) constitutes the final response. Table 1 presents a detailed description and sources of these components.

As highlighted in the literature review, there remains a dearth of a comprehensive framework that encompasses both individual and external environmental dimensions to thoroughly examine stimuli. Consequently, this study identifies three variables - information acquisition, social norms, and perceived grassroots government support - as stimulus factors at the individual level, intra-resident-group external environmental, and extra-resident-group external environmental stimuli, respectively. First, information access refers to the process of obtaining specific information (Dai et al., 2022). In this study, information acquisition pertains to the capability of residents to access and comprehend pertinent project and participation-related information during their involvement in the neighborhood regeneration. To measure information acquisition, this study uses three indicators: accessibility, completeness, and comprehensibility of information. Second, social norms in this study refer to participants’ perception of the social pressures that either encourage or discourage them from engaging in specific behaviors (Ajzen, 1991), thus reflecting their proclivity towards collective action. It refers to the influence of family members, peer groups, or community culture on individual participation behavior. This stimulus factor is generated through the internal interaction of the resident

Table 1 The attributes of identified variables.

Variables	Indicators	Reference
Stimulus	Information Acquisition	Accessibility to project/ participation information Completeness of project/ participation information Comprehensibility of project/ participation information (Dai et al., 2022; Wu and Xiong, 2022)
	Social norms	Influence from family Influence from neighbors Influence from friends (Dai et al., 2022; Xiao et al., 2023)
Stimulus	Perceived grassroots government support	Promotional support Financial support (Liu et al., 2021a, 2021b; Wu and Xiong, 2022)
	Coordination support	Coordination support
Organism	Participation attitude	Knowing the importance Good feeling about participation Supporting for participation Value identity join the discussion (Gu et al., 2022; Lin et al., 2022; Liu et al., 2018; Tang et al., 2022)
	Participation behavior	provide ideas and suggestions spend time persuade others (Dai et al., 2022; Lin et al., 2022; Tang et al., 2022)

group, in contrast to the individual-level stimulus factor “information acquisition,” which can directly affect individuals. Therefore, it is defined as an external environmental stimulus from inside the resident group. In this study, influences from family, neighbors, and friends are used to measure social norms. Third, perceived grassroots government support refers to the residents’ perception of the grassroots government’s support to make participation possible (Wang et al., 2022a). This stimulus factor is selected as an extra-resident-group external environmental stimulus because residents cannot cope with some complex and specialist issues on their own and therefore need to seek help from the government for better participation. This study measures residents’ perceived grassroots government support using three indicators: promotional support, financial support, and coordination support.

The term “Organism” is the second component of the SOR theory and refers to the affective and cognitive state of individuals when they interact with stimuli (Ying et al., 2022). In this study, the concept of attitude is used to reflect the internal state of residents when participating in neighborhood regeneration. Attitude refers to a psychological and emotional tendency expressed by evaluating a particular affair or behavior with favor or disfavor (Eagly and Chaiken, 1993). As negative attitudes are less likely to result in active participation in regeneration activities (Jia et al., 2021), this study focuses solely on positive attitudes. Four indicators, namely knowing the importance, good feelings about participation, support for participation, and value identity, are used to measure positive participation attitudes.

Participation attitudes can be influenced by stimulus factors. Prior research has demonstrated that information can significantly impact participants’ attitudes towards engagement (Shen et al., 2023). Accessible information has the potential to foster a positive perception of residents’ participation (Sarvilinna et al., 2018). Additionally, previous research has argued that social norms can shape individuals’ behavioral attitudes because individuals’ perceptions and emotional evaluations of behavior are easily infected by the opinions and suggestions offered by other important individuals (e.g., family, neighbors, and friends). (Samadaee Geleghkolae et al., 2021). In general, the stronger the perceived positive social norms, the more likely residents are to develop positive attitudes towards participation to adapt themselves to the expectations of the group around them (Luo et al., 2022). Furthermore, a positive relationship between government support and residents attitudes towards participation in public affairs has been well documented

in previous literature (Cheng et al., 2020; Samadaee Geleghkolaei et al., 2021). When implementing neighborhood regeneration projects in China, the more support the grassroots government provides, the more likely it is to reshape residents' perceptions and attitudes towards neighborhood regeneration (Liu et al., 2021a, 2021b). Consequently, the following hypotheses are proposed:

- H1. Information acquisition has a significant impact on participation attitude.
- H2. Social norm has a significant impact on participation attitude.
- H3. Perceived grassroots government support has a significant impact on participation attitude.

Some scholars believe that attitude, as an individual psychological state, is the most important factor influencing individual behavior (Tang et al., 2022). The typical approach to assess the attitude of respondents towards a particular behavior is to inquire about their awareness, preference, support, and agreement regarding it (Gu et al., 2022; Lin et al., 2022; Liu et al., 2018; Tang et al., 2022). A positive attitude is associated with a stronger desire to perform specific behaviors, which has been verified in many studies (McConnell and Jacobs, 2020). In the neighborhood regeneration context, residents are likely to participate in such new public affairs (i.e., neighborhood regeneration projects) only if they inspire new psychological perceptions and positive attitudes (Miśkowiec and Masierek, 2022). If residents have a more positive attitude towards participating in neighborhood regeneration projects, they are more likely to implement participatory behaviors to join these projects (Wang et al., 2022b). Thus, we propose the following hypothesis:

- H4. The more positive the residents' attitudes towards participating in old neighborhood regeneration projects, the more likely they will be involved in the regeneration affairs.

Fig. 2 integrates the above hypotheses to show the conceptual relationships among information acquisition, social norms, perceived grassroots government support, participation attitude, and participation behavior.

## 4. Research methodology

### 4.1. Study area

The urban and neighborhood regeneration model adopted in Chongqing serves as a representative exemplar of Chinese urban development strategies (Huang et al., 2020). In 2021, Chongqing was selected as one of the first pilot cities for neighborhood and urban regeneration in China (The Central People's Government of the People's Republic of China (CPGPRC), 2021). With its wealth of experience in neighborhood regeneration and urban redevelopment, Chongqing has developed a systematic policy management framework, which has garnered repeated praise from the national government and calls for nationwide replication (Chongqing Housing and Urban-Rural Development Committee (CHURDC), 2022). Since 2021, Chongqing has implemented the regeneration of 831 old neighborhoods, with 26.62 million square meters under construction. Furthermore, according to Chongqing's 14th Five-Year Plan, the city will plan to regenerate a total area of 100 million square meters to improve the urban environment (The People's Government of Chongqing Municipality (PGCM), 2021). The plethora of neighborhood regeneration projects in Chongqing has provided ample resources and case studies for our study. As such, taking nine central districts in Chongqing as the research area, this paper conducted a questionnaire survey on residents living in dilapidated neighborhoods.

### 4.2. Questionnaire design

The questionnaire was developed based on the research framework and hypotheses described above. It is divided into two parts, one is the general demographic questions, and the other is the constructs and items of this study. All constructs were measured by multi-item scales. We used a seven-point Likert scale to measure item scores, with 1 indicating "strongly disagree" and 7 indicating "strongly agree." All the scales used were validated in previous research (Table 2). Information acquisition (IA) used a 3-item scale from Dai et al. (2022). Social norms used a 3-item scale from Dai et al. (2022) and Xiao et al. (2023). Perceived grassroots government support (PGGS) used a 3-item scale from Liu et al. (2021) and Wu and Xiong (2022). Participation attitude (ATT)

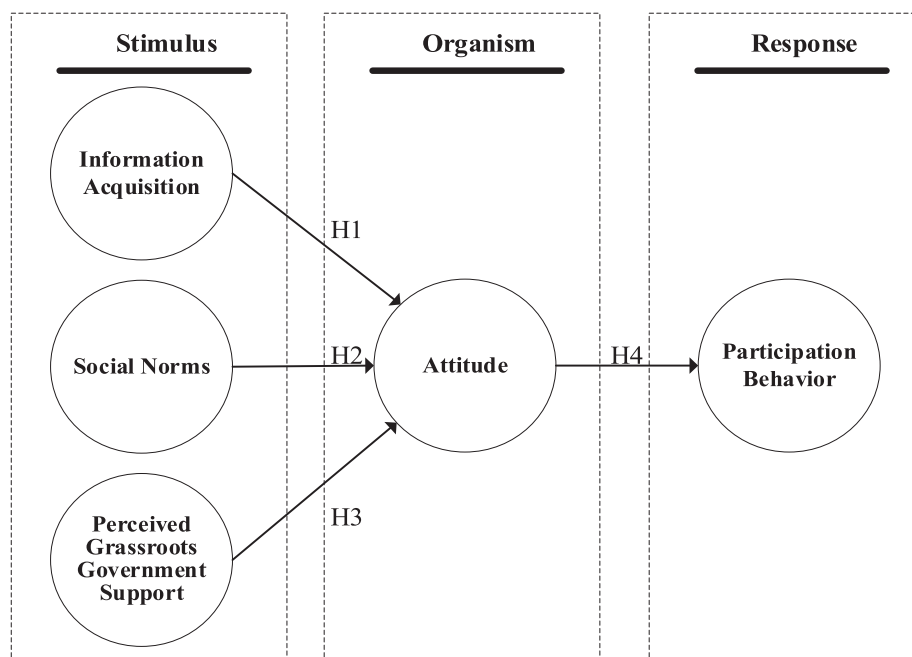


Fig. 2. A conceptual framework for hypotheses measurements.

**Table 2**  
Measures of constructs.

Variables	Item	Item wording	Reference
Stimulus	Information Acquisition	IA1 Multiple ways of providing information about neighborhood regeneration would be beneficial in motivating me to participate in this project.	(Dai et al., 2022)
		IA2 Providing complete information about neighborhood regeneration would be useful in inspiring me to join this project.	(Dai et al., 2022)
		IA3 Having a clear understanding of the information related to the neighborhood regeneration project is important for my positive attitude towards participation.	(Dai et al., 2022)
	Social norms	SN1 My family would expect me to participate in the neighborhood regeneration project.	(Dai et al., 2022; Xiao et al., 2023)
		SN2 My neighbors would expect me to participate in the neighborhood regeneration project.	(Dai et al., 2022; Xiao et al., 2023)
		SN3 Almost everyone around me is going to participate or has participated in the neighborhood regeneration project.	(Dai et al., 2022; Xiao et al., 2023)
	Perceived grassroots government support	PGGS1 Promotional support (i.e., provided knowledge, education, and technical guidance) from the government is attractive for me to participate in neighborhood regeneration projects.	(Liu et al., 2021a, 2021b; Wu and Xiong, 2022)
		PGGS2 Financial support from the government is attractive for me to participate in neighborhood regeneration projects.	(Liu et al., 2021a, 2021b)
		PGGS3 If I am provided with coordination support from the grassroots government to address any issues I may encounter during the regeneration process, I am more inclined to participate in the neighborhood regeneration project.	(Liu et al., 2021a, 2021b)
		ATT1 I think it is beneficial for residents to	(Gu et al., 2022; Liu
Organism	Participation attitude		

**Table 2 (continued)**

Variables	Item	Item wording	Reference
Response	Participation behavior	ATT2 participate in neighborhood regeneration projects.	(Tang et al., 2018; Tang et al., 2022)
		ATT3 I have a good feeling about being involved in the decision-making of neighborhood regeneration projects.	(Lin et al., 2022; Liu et al., 2018)
		ATT4 I support the view that “residents should actively participate in the decision-making of neighborhood regeneration projects”.	(Gu et al., 2022; Liu et al., 2018)
		ATT5 (deleted) I think the idea of participating in neighborhood regeneration is very useful.	(Lin et al., 2022)
		PB1 I think that residents' participation in neighborhood regeneration projects is conducive to meeting their needs for political participation.	(Zheng et al., 2023)
	Participation behavior	PB2 I have participated in a discussion about neighborhood regeneration.	(Dai et al., 2022)
		PB3 I have provided ideas and suggestions for implementing a neighborhood regeneration project.	(Dai et al., 2022; Lin et al., 2022)
		PB4 I have spent lots of time involved in neighborhood regeneration projects.	(Tang et al., 2022)
		PB5 (deleted) I have persuaded other residents to participate in the neighborhood regeneration project.	(Lin et al., 2022)
			I was involved in the vote on the regeneration plan.

used a 5-item scale from Gu et al. (2022), Liu et al. (2018), Tang et al. (2022), and Lin et al. (2022). Participation behavior used a 5-item scale from Dai et al. (2022), Lin et al. (2022) and Tang et al. (2022).

The questionnaire process comprises two distinct phases: the pre-survey and the formal survey. Citing Guo et al. (2021), the pre-survey phase involved the invitation of scholars and practitioners from relevant fields to contribute to the design of this questionnaire based on their expertise and experience. These experts possessed knowledge either in neighborhood regeneration and participation research or in the comprehensive understanding of the SEM methodology, as indicated in Table 3.

The insights and recommendations provided by these experts were carefully considered and used to refine the questionnaire. As part of this refinement process, two items, ATT5 and PB5, were removed from the questionnaire. The decision to delete ATT5 was based on two primary reasons. Firstly, experts unanimously agreed that the term “political participation” is a specialized concept that may not be easily understood



**Table 3**  
The profiles of five experts.

Role	Functions of corresponding departments
Government Officer	Works in the Chongqing Municipal Construction Commission; takes the lead in promoting the related work of neighborhood regeneration.
Grassroot Government Officer	Director of a street office in Shapingba District, Chongqing; takes the lead in organizing and facilitating resident participation.
Director	Works in the Chongqing Architectural Design Institute; participated in numerous neighborhood regeneration projects.
Professor	Works in a university; has over 20 years of research and practical experience in neighborhood regeneration and resident participation.
Professor	Works in a university; skilled in the application of SEM methodology.

by residents, potentially leading to misunderstandings and affecting the quality of the questionnaire responses. Secondly, the removal of ATT5 will not compromise the integrity of the questionnaire content. In China, citizens have opportunities for political participation through “democratic elections, democratic decision-making, democratic management, and democratic supervision.” However, within the context of neighborhood regeneration, these four aspects can be considered already encompassed within the concept of “decision-making for neighborhood regeneration,” as adequately addressed by ATT2 and ATT3. Hence, the exclusion of ATT5 also enhances the questionnaire’s conciseness. In addition, the deletion of PB5 was motivated by the significant variations observed in the regeneration processes of different dilapidated neighborhoods. Some locales are still in the early stages of negotiation, lacking a finalized regeneration plan, and have not yet reached the voting phase. To ensure the questionnaire’s alignment with the actual circumstances encountered by respondents, it was deemed essential to omit this item. This step enhances clarity and cohesiveness in the survey design.

4.3. Data collection

The respondents in this survey were residents who were in, about to make, or had already experienced neighborhood regeneration projects. The questionnaire survey was implemented between July 2022 and September 2022. Determining the appropriate sample size for SEM constitutes a critical research step. Previous studies have primarily relied on empirical guidelines, such as (1) a minimum sample size of 100 or 200 and (2) 5 or 10 observations per estimated parameter (Wolf et al., 2013; Wu and Xiong, 2022). The model utilized in this study encompassed 5 latent variables and 17 observable indicators associated with these variables. Following the approach employed by Abab et al. (2022), the minimum required sample size of 150 was calculated using the Soper online free statistical calculator. The estimated parameters and values are presented in Table 4.

Considering the aforementioned two approaches to sample size determination, it was deemed necessary to increase the target sample size to above 200 participants to achieve more robust and reliable

**Table 4**  
Sampling parameters and values.

Parameter	Values
Anticipated effect size	0.3
Desired statistical power level	0.8
Number of latent variables	5
Number of observed variables	17
Probability level	0.05
Minimum sample size to detect an effect	150
The minimum sample size for model structure	148
Recommended minimum sample size	150

results. With the assistance of the local grassroots government, a total of 427 residents took part in the face-to-face and online surveys. Eventually, 381 valid questionnaires were returned, surpassing the minimum sample size requirement, yielding an effective response rate of 89.23%.

To determine if the collected data is representative, we compared the characteristics of the sample with those of the population. As shown in Table 5, according to the basic statistics of Chongqing Municipality in the Seventh National Population Censuses (Statistics (Chongqing Municipal Bureau of Statistics), 2021), the male population accounts for 50.55%. In our survey, the proportion of male respondents was 43.83%, indicating a relatively balanced representation of genders in the sample. This suggests that our sample effectively reflects the gender distribution of the population and can be considered representative.

In addition, the sample data in this survey shows that the proportion of individuals aged 60 and above is 22.83%, which closely aligns with the official statistics of 21.87%. Comparisons among the remaining age groups are not directly feasible due to differing age ranges. However, it is noteworthy that the overall proportion of individuals below 60 is fairly similar (78.13% vs. 77.16%), with a higher percentage of young and middle-aged individuals (62.22% vs. 67.19%). Thus, in general, the age distribution of the sample can be considered representative.

From an educational standpoint, according to official data, the percentage of individuals possessing a Senior high school education or lower and a Junior college or undergraduate education is reported as 76.43% and 15.41%, respectively. In this study, the sample data reveal corresponding proportions of 76.12% and 21.52% for these categories. Consequently, the sample can be deemed representative in terms of educational distribution. Hence, the data sample utilized in this study exhibits a significant degree of consistency with and encompasses a wide representation of official statistics. This suggests that the level of sampling bias is deemed acceptable (Du et al., 2020).

4.4. Data analysis

The structural equation model (SEM) was selected as the data analysis method for this study. It is a powerful statistical technique that combines a measurement model and a structural model to investigate the complex relationships between latent constructs and their observable indicators (Byrne, 2016). The measurement model in SEM employs factor loadings to assess the associations between the observable indicators and their corresponding latent constructs, while the structural model employs path coefficients to estimate the interrelationships among the latent constructs (Kline, 2015). As a result, SEM has become increasingly popular in the field of neighborhood/urban regeneration research due to its ability to test theoretical models and explore the correlations between latent constructs that may be challenging to measure accurately through traditional statistical methods (Huang et al., 2022; Wang and Xiang, 2019). In this study, SEM was used to explore the

**Table 5**  
Comparison of Samples in the survey and official statistics.

Items	Categories	Samples in the survey	Official statistics
Gender	Male	43.83%	50.55%
	Female	56.17%	49.45%
Age	≤30	9.97%	78.13% (The population aged 15–59 accounts for 62.22%)
	31–60	67.19%	
	≥60	22.83%	21.87%
Education Level	Senior high school or below	76.12%	76.43%
	Junior college or undergraduate	21.52%	15.41%
	Master’s degree or above	2.36%	/

Note: Official statistics refer to the basic statistics of Chongqing Municipality in the Seventh National Population Censuses.

relationship between stimuli and residents' participation attitude and behaviors based on the SOR theory.

In addition, covariance-based structural equation modeling (CB-SEM) and partial least squares structural equation modeling (PLS-SEM) are two common empirical analysis approaches used in empirical research (Tang et al., 2022). While both techniques are similar, CB-SEM is the dominant approach in SEM articles due to its stability and validity, which prioritizes theory testing rather than theory building. On the other hand, PLS-SEM is typically used in more dynamic studies and the early stages of theory development (Si et al., 2021). The SOR theory has been extensively studied and well-verified in prior research. Furthermore, the hypotheses in the present study are not exploratory in nature. Based on these considerations, this study employed CB-SEM for subsequent estimates.

## 5. Results

### 5.1. Descriptive analysis of residents' participation behaviors

Table 6 provides the demographic data of the respondents. Among them, males accounted for 43.83%, females 56.17%. In terms of age, many respondents were between 31 and 60 years old, accounting for 67.19%, while the minority is under 30 years old, accounting for only 9.97%. It can be seen that most of the residents living in the old neighborhoods are middle-aged and elderly residents. As for the education level, 76.12% of the respondents have a senior high school education or below. In terms of the length of residence, most of the respondents had lived in their neighborhood for more than seven years, and 26.77% for more than ten years. As for the living floor, The largest number of respondents were from the high floors, accounting for 45.41%, while the percentage of respondents from the mid and low floors was close, both around 27%. As for the household income, nearly half of the respondents had a monthly income of RMB 5000 to 10,000, which indicates that the income level of residents living in the old neighborhoods is not very high.

In addition, Table 6 shows descriptive statistics of the participation behavior profile of the residents interviewed. The results showed that residents surveyed were almost equally divided between those with positive and negative participation behaviors (186:195). Fig. 3 has been plotted to provide a clear and concise comparison of the differences in the positive and negative behaviors within each category. As shown in Fig. 3, the distribution reveals that the active participation group is characterized by older age, longer residence time, lower education level, and higher income. The increase in age shows a growing trend in the

proportion of active participants. This divergence can be seen especially in the two age groups of under 30 and over 60. The percentage of residents with positive participation behavior is only 42.11% (16/38) in the group of young people under 30 years old, but the number rises to 55.17% (48/87) for those aged over 60. A comparable pattern is discernible when analyzing the distribution of the respondents' duration of residence. The percentage of active participants increased as the length of residence increased. In this survey, close to nearly 60% of the residents surveyed who have lived in the neighborhoods for >10 years have been actively involved in the neighborhood regeneration projects.

In addition, an interesting result is that residents on higher floors are more likely to participate in neighborhood regeneration projects than residents on lower floors. The percentage of residents on the low floor with active participation is only 32.38% (34/105), while this figure rises to 58.96% (102/173) among residents on the high floors. This may be because the addition of elevators is part of the regeneration most directly related to the economic interests of residents in dilapidated neighborhoods, and this part is more profitable for residents of higher floors.

Furthermore, the survey results in Fig. 3 show the education level and income have opposite trends on the participation behavior of residents. Residents with lower education levels tend to exhibit more positive participation behavior, which may be related to their greater expectation and dependence on the grassroots government to change their living environment. In contrast, residents with higher incomes have higher rates of active participation behavior relative to other categories. This may be due to their higher affordability for the regeneration cost. However, it is worth noting that the number of residents with higher household incomes is very low among all respondents, which proves that it is important to consider the affordability of regenerating costs for most residents.

### 5.2. Data reliability and validity testing

A good model fit is the basis for further model calculation and analysis. The goodness-of-fit of SEM indicates the appropriateness of the hypothesized model and how well it fits the empirical data. In this study, six indices were selected to assess the overall goodness-of-fit, as shown in Table 7. The results of the goodness-of-fit indices support the acceptability of the hypothesized model. As shown in the second row of Table 7, the measurement models have an acceptable fit to the data, compared with the desirable ranges presented in the first row (Black et al., 2010; Byrne, 2016; Kline, 2015).

Ensuring the reliability of empirical data is a crucial aspect of

**Table 6**  
The demographic composition of the samples.

Items	Categories	Positive participation behavior	Percent (%)	Negative participation behavior	Percent (%)
Gender	Male	77	46.11	90	53.89
	Female	109	50.93	105	49.07
Age	≤30	16	42.11	22	57.89
	31–60	123	48.05	133	51.95
	≥60	48	55.17	39	44.83
Education Level	Senior high school or below	150	51.72	140	48.28
	Junior college or undergraduate	34	41.46	48	58.54
	Master's degree or above	3	33.33	6	66.67
Monthly Household Income	≤2500 CNY	9	37.50	15	62.50
	2500–5000 CNY	50	40.98	72	59.02
	5000–10,000 CNY	87	54.04	74	45.96
	10,000–30,000 CNY	37	53.62	32	46.38
	≥30,000 CNY	4	80.00	1	20.00
Living Time (years)	≤3	16	47.06	18	52.94
	4–6	29	50.88	28	49.12
	7–9	84	54.19	71	45.81
	≥10	79	58.52	56	41.48
Living Floor	Low Floor	34	32.38	71	67.62
	Mid Floor	51	49.51	52	50.49
	High Floor	102	58.96	71	41.04

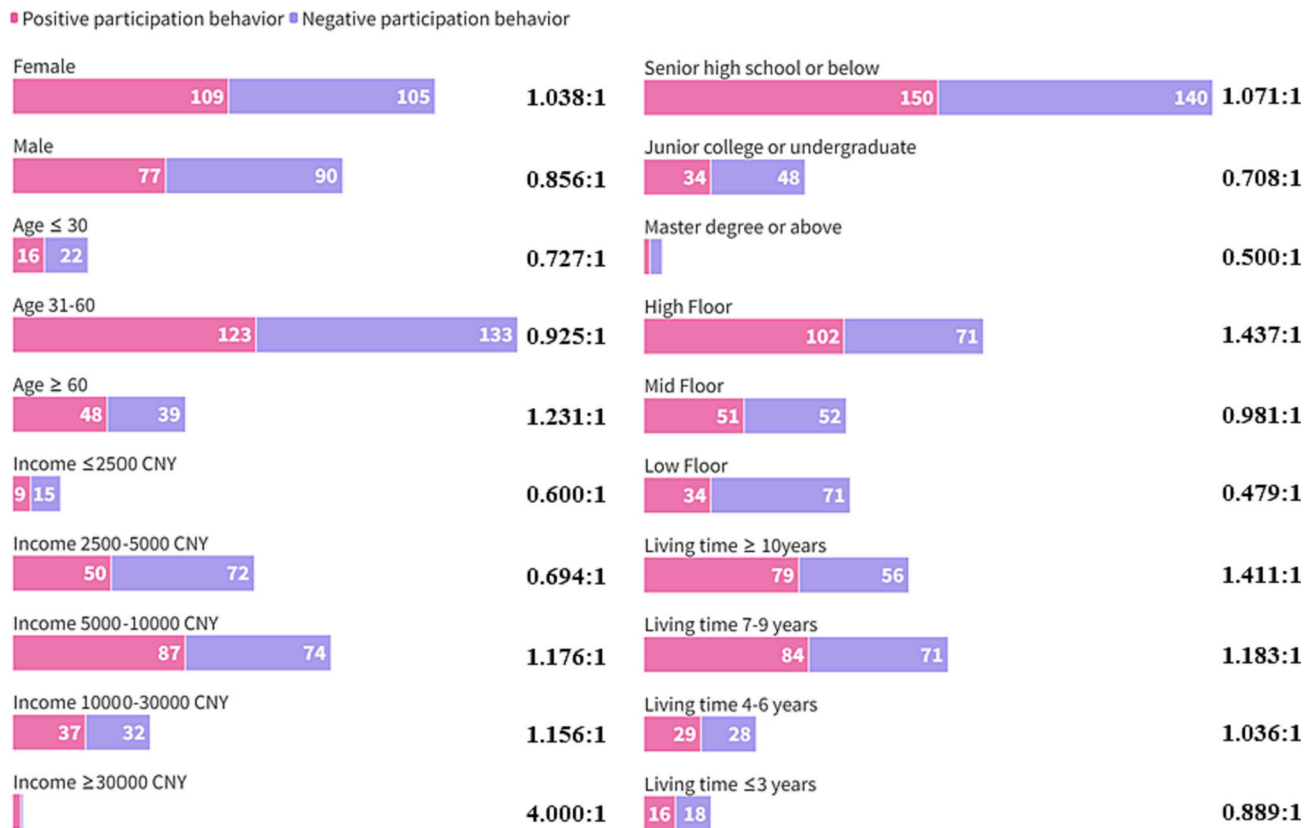


Fig. 3. Differences in the positive and negative behaviors.

Table 7  
The goodness of fit of the model.

Fit index	$\chi^2/DF$	CFI	TLI	RMSEA	SRMR
Criteria	≤5.0	≥0.90	≥0.90	≤0.10	≤0.08
Value	3.151	0.955	0.946	0.075	0.077

conducting accurate calculations and analyses (Hair et al., 2013). Typically, Cronbach's alpha and construct reliability are employed for reliability testing. Previous research has suggested that the value of Cronbach's alpha coefficient between 0.50 and 0.70 means the reliability is moderate, while over 0.70 shows excellent reliability (Hinton et al., 2014). As presented in the second column of Table 8, Cronbach's alpha values for all constructs range from 0.751 to 0.963, surpassing the 0.7 threshold. Additionally, the construct reliability values of all constructs, presented in the third column of Table 8, range from 0.754 to 0.963, which are also higher than the 0.7 standard (Hair et al., 2013). Thus, the measurement model exhibits good internal consistency and reliability.

Further, we test the validity of the hypothesized model, including convergence validity and discriminate validity. First, to test the convergence validity, the average variance extracted (AVE) is employed,

Table 8  
Testing results of reliability and validity.

Dim.	Cronbach's alpha	Construct Reliability	Convergence Validity(AVE)	Discriminate Validity			
IA	0.823	0.832	0.623	<b>0.789</b>			
SN	0.751	0.754	0.506	0.444	<b>0.711</b>		
PGGS	0.946	0.948	0.859	0.400	0.329	<b>0.927</b>	
ATT	0.963	0.963	0.868	0.544	0.709	0.480	<b>0.932</b>
PB	0.887	0.887	0.665	0.379	0.494	0.335	0.697 <b>0.815</b>

Note: CR, construct reliability; AVE, average variance extracted.

which measures the average amount of variance explained by a construct in its corresponding items. If the AVE value is >0.5, it indicates that the construct has good explanatory power (Black et al., 2010). As displayed in the fourth column of Table 8, all constructs in our model exhibit AVE values above 0.5, indicating acceptable levels of convergence validity. Second, we assess the discriminant validity of the model by examining the correlations between the constructs. Discriminant validity ensures that each construct is distinct from others and is measuring a unique concept. According to Fornell and Larcker (1981), the square root of AVE was placed on the diagonal, and the triangle below was the Pearson Correlation Coefficient of the dimensions. As presented in columns 5 to 9 of Table 8, the square root of the AVE values for each construct (bold font) is greater than the correlation between that construct and others, indicating adequate discriminant validity. Therefore, the hypothesized model exhibits good convergence and discriminant validity.

### 5.3. Analysis of the measurement model

The measurement model serves to reveal the relationships between latent variables and their observable indicators. Factor loadings are commonly utilized to evaluate the strength of the association between each observable indicator and its corresponding latent variable. As

illustrated in Table 9, all factor loadings in the measurement model are statistically significant ( $p < 0.001$ ), ranging from 0.675 to 0.958, surpassing the threshold value of 0.5 (Fornell and Larcker, 1981).

Information acquisition denotes the extent to which individual residents have obtained information about the project and participation in neighborhood regeneration. The findings indicate that the accessibility to project/ participation information ( $FL_{IA1} = 0.860$ ) has the highest impact on information acquisition, followed by completeness of project/ participation information ( $FL_{IA2} = 0.771$ ) and comprehensibility of project/ participation information ( $FL_{IA3} = 0.732$ ).

Social norms pertain to the extent to which residents' perceptions are influenced by significant others. The results suggest that influence from family ( $FL_{SN1} = 0.758$ ) exerts the greatest impact on social norms, followed by influence from neighbors ( $FL_{SN2} = 0.699$ ) and influence from friends ( $FL_{SN3} = 0.675$ ).

Perceived grassroots government support signifies the support that residents receive from the grassroots government when they participate in the process of neighborhood regeneration. In this study, perceived grassroots government support is significantly affected by financial support ( $FL_{PGGS2} = 0.958$ ), followed by coordination support ( $FL_{PGGS3} = 0.942$ ) and promotional support ( $FL_{PGGS1} = 0.879$ ).

Participation attitude implies potential attendant actions (Wang, Dong, et al., 2022). The results demonstrate that value identity ( $FL_{ATT4} = 0.950$ ) has the most significant impact on participation attitude, followed by supporting for participation ( $FL_{ATT3} = 0.948$ ), knowing the importance supporting for participation ( $FL_{ATT1} = 0.932$ ), and good feeling about participation supporting for participation ( $FL_{ATT2} = 0.895$ ).

In terms of participation behavior, the most significant indicator is persuading others ( $FL_{PB4} = 0.875$ ), followed by spending time ( $FL_{PB3} = 0.833$ ), providing ideas and suggestions ( $FL_{PB2} = 0.825$ ) and joining the discussion ( $FL_{PB1} = 0.720$ ).

#### 5.4. Analysis of the structural model

The results show that the hypotheses have been verified and all hypothetical relationships have been accepted. Table 10 provides the corresponding path coefficient,  $P$ -value, and hypothesis verification results. On the whole, all four hypotheses (H1 to H4) were supported.

Fig. 4 presents the final model with standardized path loadings. The findings indicate that all of the path coefficients are significant at a level of  $p < 0.001$ . To be more precise, information acquisition, social norms,

**Table 9**  
Results of confirmatory factor analysis.

Construct	Measurement Item	Factor Loading (FL)
Information Acquisition	IA1 Accessibility to project/ participation information	0.860***
	IA2 Completeness of project/ participation information	0.771***
	IA3 Comprehensibility of project/ participation information	0.732***
Social Norms	SN1 Influence from family	0.758***
	SN2 Influence from neighbors	0.699***
	SN3 Influence from friends	0.675***
Perceived Grassroots Government Support	PGGS1 Promotional support	0.879***
	PGGS2 Financial support	0.958***
	PGGS3 Coordination support	0.942***
Participation attitude	ATT1 Knowing the importance	0.932***
	ATT2 Good feeling about participation	0.895***
	ATT3 Supporting for participation	0.948***
	ATT4 Value identity	0.950***
Participation Behavior	PB1 join the discussion	0.720***
	PB2 provide ideas and suggestions	0.825***
	PB3 spend time	0.833***
	PB4 persuade others	0.875***

Note: \*\*\*  $p < 0.001$ .

**Table 10**  
Results of path coefficients and hypotheses testing.

Hypotheses	Path	Standardized path coefficient	$P$ value	Hypothesis supported
H1	IA → ATT	0.218	***	Yes
H2	SN → ATT	0.541	***	Yes
H3	PGGS → ATT	0.215	***	Yes
H4	ATT → PB	0.697	***	Yes

(Note: \*\*\* represents  $P < 0.001$ .)

and perceived grassroots government support all have positive impacts on participation attitudes. Among these, social norms possess the highest standardized path coefficient value (H2: 0.541\*\*\*), followed by information acquisition (H1: 0.218\*\*\*) and perceived grassroots government support (H3: 0.215\*\*\*). Additionally, participation attitude has a significant impact on participation behavior (H4: 0.697\*\*\*).

## 6. Discussion

### 6.1. The prerequisite for overcoming psychological inertia: Providing high-quality information (hypothesis 1)

According to Table 10 (Section 5.4), the results of this study indicate that information acquisition has a significant impact on residents' participation attitudes, thereby confirming Hypothesis 1. This also indicates that providing high-quality information is a prerequisite for overcoming psychological inertia and promoting resident participation at the individual level. Prior research has emphasized the crucial role of information in stimulating residents' participation. For instance, Wu and Xiong (2022) stated that the provision of information is the basic condition for residents to participate in neighborhood regeneration projects. Similarly, Acciai and Capano (2021) contend that only by establishing an open information system can residents acquire sufficient information and lower the cost of information to increase their excitement for public affairs. The present study builds on this literature by offering new insights from the perspective of overcoming psychological inertia and emphasizing the need for high-quality information acquisition. Specifically, the study suggests that enhancing information accessibility, completeness, and comprehensibility are essential elements of promoting resident participation in sustainable neighborhood development.

Increasing the accessibility of information means expanding the channels for information dissemination. By diversifying forms of dissemination such as community meetings, community notifications, and online platforms, the accessibility of information can be improved, thereby increasing the effectiveness of information tools (Wu and Xiong, 2022). The empirical results of this study substantiate this proposition. Specifically, as depicted in Table 9 (Section 5.3), accessibility to information demonstrated the highest factor loading value ( $FL_{IA1} = 0.860$ ) among the three observable indicators within this construct, quantitatively underscoring the significance of providing information through multiple channels.

Regarding the completeness of information, Kim et al. (2020) contend that municipalities should furnish adequate information on neighborhood regeneration and its potential social, economic, and environmental value throughout the regeneration process. By receiving sufficient information, residents can make better-informed decisions (Shen et al., 2023). In this study, Table 9 in Section 5.3 shows that the completeness of information had a significant effect on residents' participation attitude ( $FL_{IA2} = 0.771$ ).

Moreover, it is important to enhance the comprehensibility of the information. A successful neighborhood hinges on residents' full understanding of the whole need and process of regeneration. Nudging strategies based on information that residents do not comprehend will not yield reliable outcomes (Abas et al., 2023). Table 9 in Section 5.3 demonstrates that information comprehensibility has a significant



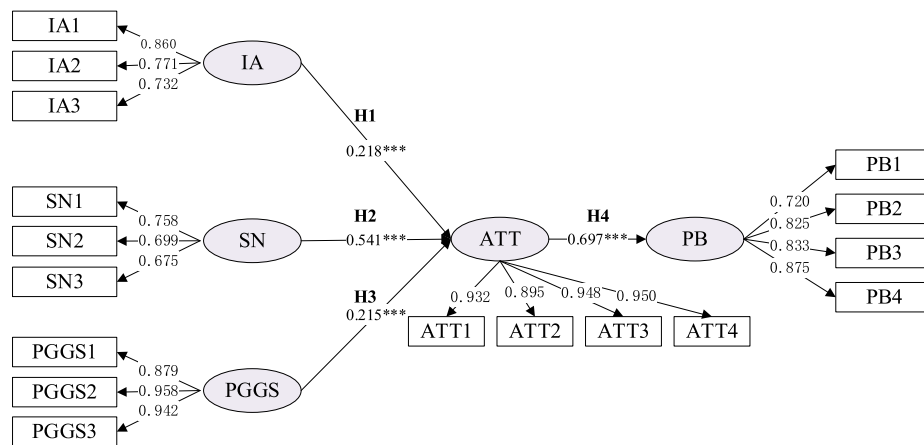


Fig. 4. Standardized estimates of the research model. (Note: \*\*\* $p < 0.001$ .)

impact on residents' participation attitudes ( $FL_{IA3}=0.732$ ). The findings of this study offer a quantitative supplement to the importance of information comprehensibility.

6.2. The inherent motivation for overcoming psychological inertia: Utilizing social norms (Hypothesis 2)

Based on the results presented in Table 10 (Section 5.4), it can be concluded that social norms have a direct and significant impact on residents' attitudes towards participation and are the most influential of the three stimuli. This suggests that leveraging the prevailing social norms within the resident groups can be an effective strategy to overcome the existing psychological inertia of participation. However, this finding is contrary to the results of some previous studies that explored residents' participation behavior in urban regeneration projects. For instance, Zhang et al. (2021) found that social norms had no direct effect on public acceptance, while Xiao et al. (2023) found that social norms had no significant effect on personal norms. The reason for the different results may be that this study focused on the decision-making process of neighborhood regeneration projects, while Zhang et al. (2021) focused on industrial regeneration projects and Xiao et al. (2023) focused on energy conservation and emission reduction in the regeneration of dilapidated neighborhoods.

Chinese-specific cultural and cognitional context may explain why social norm is the strongest external stimulus. Chinese residents have long been nurtured by collectivism, characterized by a preference for interdependent relationships with other group members. As a result, residents with a collectivist cultural background are likely to give more influence on the opinions of other members (Huang et al., 2023b). Neighborhoods are seen as homogeneous aggregations of residents with similar normative values and practices. If a group of residents has a participation style that is formed and preferred, this may encourage other residents to have a positive attitude towards participating and to get involved in the same way (Xu et al., 2017). This means that their families, neighbors, and surroundings will heavily influence residents' participation attitudes and the implementation of their behaviors (Li et al., 2022). In other words, social norms and pressures may drive the change of psychological inertia and the formation of positive attitudes and behaviors towards active participation in older neighborhoods where residents' social relationships have been established for many years (Huang et al., 2023c).

According to Whitham (2021), social norms greatly influence social exchange, which can further influence participation and joint actions within a community. The findings of our study support this view. The positive impact of social norms on residents' participation attitudes and behaviors have also been well documented in previous studies (Gu et al.,

2022; Tang et al., 2022). Furthermore, as shown in Table 6 (Section 5.1), the study also indicates that older and longer-term residents are more likely to engage in positive behaviors. This may be due to two reasons. Firstly, older residents who have lived in the neighborhood for a longer period are more likely to have a sense of place attachment to the neighborhood, and they are less likely to be able to move out of this neighborhood actively (Xu et al., 2022). Therefore, they are more willing to participate in regeneration activities to enhance the beautification of the neighborhoods. Secondly, these older and longer-term residents are more influenced by social norms, which leads to stronger social connections among residents and a greater impact of neighborhood interactions on their attitudes and behaviors towards participation (Du et al., 2023). Thus, the findings have practical implications for managers and policymakers. They should take into account the importance of social norms in promoting resident participation and develop strategies that leverage the prevailing social norms and relationships within the resident groups. Specifically, managers can prioritize mobilizing a group of long-term and older residents in the neighborhood, who may become opinion leaders, and use their influence to drive the change of psychological inertia and promote a positive attitude towards participation among other residents. This approach can be the most effective inherent motivation for promoting resident participation in the regeneration activities.

6.3. The external impetus for overcoming psychological inertia: Strengthening grassroots government support (Hypothesis 3)

According to Table 10 in Section 5.4, the results of this study show that perceived grassroots government support has a significant effect on residents' participation attitudes, thereby supporting Hypothesis 3. This implies that, aside from utilizing the social norms established within the resident groups to tackle the issue of psychological inertia, bolstering support from the grassroots government is another external environmental factor that can facilitate overcoming it. Previous studies have also discussed the role of the government in promoting residents' participation in public affairs (Li et al., 2020; O'Neill et al., 2023; Wang et al., 2022a, 2022b, 2022c). Nevertheless, this research distinguishes itself by delving into the concept of "grassroots government" to examine the government's role more comprehensively. The grassroots government, while being positioned as the final level of the government's organizational structure, also possesses some functions of community organizations. In essence, it acts as both the final executor of policies and administrative directives and the organization directly connected to residents in governance processes (Tang, 2020). The presence of grassroots government signifies a unique administrative governance structure in China. Nevertheless, the theoretical foundation of previous



research on government-resident interactions has primarily originated from Western contexts, where neighborhood governance has long been established based on assumptions that delineate clear boundaries between the government, the market, and civil society. This contrast is evident when compared to the administrative governance mode in China. Consequently, this paper investigates the role of grassroots government in the regeneration process of dilapidated neighborhoods, thus providing a valuable supplement to previous research that overlooked this aspect. Furthermore, it offers a localized interpretation of administrative governance and public participation in the Chinese context, ultimately enhancing support and promotion of resident participation in practical applications.

As shown in Table 9 in Section 5.3, financial support exhibits the highest factor loading value ( $FL_{PGS2}=0.958$ ), implying that government financial support is the most stimulating and attractive factor for resident participation. This finding is corroborated by an initiative undertaken by the Chinese government in 2020, known as the “I have something to say to the Prime Minister” event, which aimed to solicit feedback from residents on domestic policies. Notably, one of the primary concerns expressed by residents was the need to reduce the cost of neighborhood regeneration for low-income households (Chinese government website (CGW), 2020). Hence, providing government financial support to alleviate the cost of regeneration for residents could be a key strategy to foster their participation.

Furthermore, coordination support from the grassroots government had a significant impact on promoting resident participation ( $FL_{PGS3}=0.942$ ), as presented in Table 9 in Section 5.3. Coordination support involves the assistance provided by the grassroots government in regenerating dilapidated neighborhoods beyond residents' capacity, such as feasibility assessment of regeneration plans, selection of construction teams, and conflict resolution between residents on lower and upper floors when adding elevators. Residents often lack the knowledge and skills to make informed decisions on complex urban development issues (Lu, 2020). Hence, it has been suggested that government organizations should promote the participation of residents in neighborhood regeneration projects (Baek and Kwon, 2020). The empirical results of this study confirm that coordination support from the grassroots government positively impacts resident participation in neighborhood regeneration projects. Meanwhile, the results in Table 6 in Section 5.1 indicate that residents with lower levels of education are more active in participation. This may be attributed to their relatively weaker problem-solving abilities, leading them to rely more on government support.

#### 6.4. The core of resident participation: Value identity driven by personal interests (Hypothesis 4)

According to Table 10 in Section 5.4, the results of this study show that residents' participation attitude has a significant effect on participation behavior, thereby supporting Hypothesis 4. Previous research has confirmed that positive attitudes can significantly influence the performance of specific behaviors (McConnell and Jacobs, 2020). This study extends this knowledge by presenting empirical evidence from the field of neighborhood regeneration.

Moreover, Table 9 in Section 5.3 shows that the factor loading for value identity ( $FL_{ATT4}=0.950$ ) is the highest among the four observable indicators within this construct. Table 6 in Section 5.1 reveals that residents living on higher floors tend to exhibit more active participation behavior than those residing on lower floors. These findings together suggest that residents' value identity towards neighborhood regeneration primarily revolves around their interests. In the context of neighborhood regeneration projects, there exist various decision-making aspects that warrant consideration. Among these contents, the installation of elevators tends to evoke a great deal of concern from residents. This stems not only from the potential impact of such installations on the built environment and means of transportation for residents but also from the underlying economic game that exists between high-rise and

low-rise residents. Broadly speaking, the addition of elevators has the potential to increase property values for high-rise residents. Conversely, it may lead to a decrease in economic value for low-rise residents. As a result, low-rise residents are often reluctant to participate and hold dissenting opinions, as supported by the findings in this study.

#### 6.5. Overcoming psychological inertia to achieve resident participation in sustainable neighborhood development

The regeneration of dilapidated neighborhoods involves the judicious reuse of urban resources to achieve optimal outcomes by integrating existing resources with minimized investments (Wu et al., 2023). Unlike the past focus on spatial production through large-scale demolition and reconstruction, the current era of neighborhood regeneration underscores the significance of collaborative efforts between the government and residents in community development. The transformation has led to the failure of the previous model, which relied entirely on an elite alliance of government and developers for urban development. Exclusive reliance on the government and developers for neighborhood planning and design may lead to overlooking pertinent issues and challenges faced by the neighborhoods (Dai et al., 2022). The residents living within these neighborhoods possess an unparalleled understanding of these issues. Thus, an increasing number of scholars advocate the attentive consideration of in-situ residents' voices and active encouragement of their participation in public affairs (Antunes et al., 2020; Zheng et al., 2023).

Nevertheless, the psychological inertia in public participation, inherited from the historical “danwei system,” has been further entrenched during the period of large-scale demolition and reconstruction. Overlooking the potential impact of psychological inertia in participation behavior may render calls for resident involvement ineffective. This oversight stems from the assumption that residents will automatically engage when allowed to participate, neglecting to ascertain whether residents are genuinely “willing” and “able” to partake. Therefore, this paper adopts an innovative perspective of “overcoming psychological inertia” to address the underlying issue and redefine resident participation behavior. It emphasizes that, in the context of the new era of neighborhood regeneration, resident participation should encompass “breaking the existing psychological inertia” and “restructuring active participation behavior.” While participation behavior may evolve, the governance approach based on the triad of “identifying psychological inertia - providing corresponding stimuli - reshaping active participation behavior” will remain efficacious. Thus, the governance strategies proposed in this paper, grounded in overcoming psychological inertia to promote resident participation, hold the potential as a reference for future urban sustainable development.

Moreover, this study demonstrates a novel integration of behavioral psychology into the investigation of resident participation in neighborhood regeneration. By applying the SOR theory framework, it explores the process of external stimuli leading to attitude changes and subsequently triggering changes in participation behavior. This pioneering approach furnishes both theoretical underpinning and pragmatic strategies to foster resident participation effectively. Based on the results presented in Section 5.4, all hypotheses proposed in this study have been supported. This implies that promoting changes in residents' participation psychological inertia and the formation of positive attitudes can be achieved by providing high-quality information (Hypothesis 1), utilizing established social norms among residents (Hypothesis 2), and strengthening support from grassroots governments (Hypothesis 3). In addition, Section 6.4 highlights the importance of prioritizing residents' interests in promoting their participation (Hypothesis 4). It can be observed that the identification of stimulating factors and the development of policies that align with residents' interests are critical to successfully overcoming inertia and cultivating resident participation.

## 7. Conclusion and policy implications

Neighborhood regeneration has emerged as a fundamental factor in advancing environmental improvements. In this context, fostering active participation among residents assumes a pivotal role in promoting effective environmental management strategies. This paper offers a unique contribution to the academic literature on promoting resident participation by presenting the novel concept of “overcoming psychological inertia and restructuring participation behavior.” This perspective offers valuable insights for promoting resident participation and represents a significant supplement to existing research. Furthermore, this study explores the role of stimuli and analyzes how these stimulus factors shape the formation of residents' participation behaviors. The research hypotheses were posed based on the SOR theory. A questionnaire survey was conducted in Chongqing, and SEM was used to analyze the data and test the hypotheses. The results in this study show a direct relationship between three stimuli factors, namely information acquisition, social norms, and perceived support from the grassroots government, and the residents' attitude towards participating in the neighborhood regeneration projects. Moreover, a direct relationship between attitudes and participation behavior was observed. Therefore, it is recommended to increase the accessibility, comprehensiveness, and understandability of information as high-quality information acquisition is a prerequisite for stimulating resident participation. Additionally, the findings indicate that social norms are the most influential catalyst for stimulating resident participation. Friends, neighbors, and family members exert an increasing influence on the residents' attitudes towards participation. Furthermore, the empirical research underscores the essential role of grassroots government in conducting neighborhood regeneration projects and promoting resident participation behaviors. Notably, economic support emerged as the most appealing form of assistance to residents.

Based on the aforementioned empirical analysis and corresponding discussions, several policy implications are proposed to enhance resident participation in neighborhood regeneration. First, the government should establish and improve public participatory information mechanisms. More specifically, this objective can be achieved through a symbiotic relationship between the government and enterprises, utilizing advanced intelligent technologies to provide comprehensive information consultation services throughout the entire process. The ultimate objective revolves around facilitating residents' seamless and timely access to premium information throughout the neighborhood regeneration process, thereby mitigating potential impediments to their participation that may arise from constrained information accessibility.

Second, it is imperative for the government to duly recognize and appreciate the pivotal role assumed by resident leaders. Empirical research findings presented in this paper attest that senior denizens with extensive tenure exhibit greater susceptibility to social norms and are more prone to engaging in constructive participation. In light of these insights, administrators should accord priority to mobilizing esteemed and influential long-term and elderly residents, empowering them as resident leaders within the neighborhood. Leveraging their intrinsic capabilities and sway, these leaders can effectively galvanize fellow inhabitants to surmount inertia and actively partake in neighborhood regeneration, thus successfully shattering the impasse of resident participation as the ‘silent majority.’

Third, a proactive utilization of the facilitating role played by the grassroots government is of paramount importance. Amidst the neighborhood regeneration endeavor, numerous intricate challenges surface, surpassing the residents' capabilities to redress. Consequently, an observable phenomenon emerges, wherein residents harbor the intent to participate but encounter limitations impeding their capacity to engage effectively. To address this conundrum, the grassroots government can contemplate the establishment of specialized teams tasked with interfacing directly with the neighborhood, furnishing residents with indispensable services, and thus optimizing their role as coordinators and

enablers. For example, the “Planners, Architects, Engineers Entering Communities” program is being vigorously implemented in Chongqing to compensate for the lack of expertise among residents (Huang et al., 2023b). The success of this approach suggests its potential for a nationwide expansion, with other provincial and municipal grassroots governments customizing specialized support measures to suit their respective local conditions.

The current study possesses certain limitations, which also point towards potential avenues for future research. Firstly, the scope of the present paper is restricted to analyzing resident participation behavior in the project decision-making stage, with the exclusion of discussions related to the construction and operational phases. Given that the implementation of neighborhood regeneration is a dynamic process, it is plausible that residents' attitudes and behaviors towards participation may change over time. Thus, it is recommended that future studies incorporate temporal considerations in the analysis of longitudinal variables. Secondly, given that residents' participation in China is still nascent, our study refrained from presenting a detailed classification of residents' participation behaviors, opting instead for a broader definition to yield a richer experimental sample. In future studies, it would be valuable to further subdivide residents' participation behavior in neighborhood regeneration projects according to their degree of involvement, which would contribute to a more nuanced understanding of public participation.

### CRedit authorship contribution statement

**Xinyue Fu:** Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Queena K. Qian:** Formal analysis, Validation, Writing – review & editing. **Guiwen Liu:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Investigation, Funding acquisition, Conceptualization. **Taozhi Zhuang:** Data curation, Formal analysis, Validation, Funding acquisition, Writing – review & editing. **Henk J. Visscher:** Supervision, Resources, Conceptualization. **Ruopeng Huang:** Writing – review & editing, Investigation, Data curation, Validation.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data availability

Data sources have been explained in the article.

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