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Institutional environment and passive co-production: exploring the roles of government deterrence and social norms

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ABSTRACT

Co-production has been widely advocated for integrating democratic values into public service delivery, yet passive co-production – mainly driven by external forces – remains under-explored. This research redefines passive co-production through the lens of policy implementation and compliance, developing a theoretical model grounded in the Institutional Analysis and Development framework. Using a design combining survey with survey experiment, the model was tested in both crisis (pandemic prevention) and routine (garbage classification) scenarios in China. Results reveal that government deterrence and social norms significantly drive passive co-production under crisis scenario, whereas only social norms matter in routine setting. Additionally, the interaction between deterrence and social norms varies across scenarios. By expanding co-production's boundary to include passive forms across different settings, this study not only highlights the need to examine ethical concerns and long-term implications of passive co-production, but also calls for further testing of findings along the active-passive co-production continuum.

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KEYWORDS Passive co-production; policy compliance; deterrence; social norms; Institutional Analysis and Development Framework

Introduction

Passive co-production represents a significant yet under-explored dimension of citizen participation in public service delivery. Unlike active co-production, which emphasizes citizen-led initiatives and voluntary engagement in service provision and public value creation (Acar, Steen, and Verschuere 2023; Bovaird and Loeffler 2012; Brandsen, Steen, and Verschuere 2018), passive co-production captures scenarios where citizens are constrained contributors and is often characterized by two core characteristics: varying degrees of involuntariness and mobilized by external

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coercion, such as snow removal, garbage classification, workplace donations, state-led volunteering or staying at home during COVID-19 (Christensen, Nesbit, and Stritch 2018; H. Li and Lu 2024; Sharp 1980; Tõnurist and Surva 2016). Citizens may fear that failing to co-produce will result in explicit losses (e.g. fines) or implicit costs (e.g. affecting employment and promotion, or erosion of their social identity as a 'good' citizen).

While the phenomenon of passive co-production remains pervasive in public governance globally (Nabatchi, Sancino, and Sicilia 2017; Sharp 1980), there remains debate on whether citizens' compliance with policies or participation with limited voluntariness should be considered as co-production, since these behaviours may extend beyond mere compliance by emphasizing citizens' contributions to public value (Alford 2009; Brandsen and Honingh 2016; Brudney and England 1983; H. Li and Lu 2024; Sharp 1980; Tõnurist and Surva 2016; Whitaker 1980). Therefore, understanding this phenomenon is critical as it challenges the voluntarism ideals traditionally associated with co-production and raises questions about its implications for democratic governance.

Theoretically, passive co-production is an essential concept for understanding government-citizen interactions (McMullin 2025; Souza and Neto 2018) and how public services function, especially in contexts where citizen engagement is shaped by institutional constraints (Trætteberg and Enjolras 2024). While prior literature has conceptualized citizens' compliance with policies as manipulative co-production (Souza and Neto 2018) or citizens taking responsibilities as enforced co-production in a continuum of citizen participation (Fotaki 2011; McMullin 2025; Pestoff 2018), there remain gaps in comprehensively examining the passive role of citizens compared to the active one. Furthermore, defining co-production comprehensively and practically is crucial for theory development and policy application (Brudney and England 1983). This is particularly relevant as governments increasingly utilize both carrot and stick, as well as nudging instruments to mobilize citizen co-production, particularly under budget constraints and limited effects of economic incentives (Barbera et al. 2025; W. Voorberg et al. 2018), or in initiatives aimed at helping ex-prisoners and the unemployed (re-)enter the society (Rich 1981).

Specifically, the Institutional Analysis and Development (IAD) framework offers an analytical lens to examine how institutional rules and community norms, functioning as two key exogenous elements, may shape co-production behaviour within collective action arenas. Existing studies have proven that coercive measures, such as compulsion, penalties, and mandates, could act as hard institutional constraints (Alford and O'Flynn 2012; Tõnurist and Surva 2016; Williamson et al. 2022), while nudging tools, such as social norms, moral appeals, and peer influence, may serve as softer mechanisms to encourage citizen co-production (Biel and Thøgersen 2007;

Bovaird et al. 2016; Cialdini, Reno, and Kallgren 1990; Everett et al. 2020; Lee and Na 2024). However, mobilizing co-production in practice faces significant challenges, including high mobilization costs, low citizen motivation, complex governance settings, and inconsistent participation outcomes (Jakobsen 2013; Loeffler and Bovaird 2018; Sicilia et al. 2016; Thomsen, Baekgaard, and Jensen 2020). These barriers may be more pronounced in the context of passive co-production.

While passive co-production holds both theoretical and practical significance in government-citizen interactions, empirical evidence on how deterrence and nudging instruments may interactively shape passive co-production remains limited. Existing explorations related to passive co-production remain conceptual or descriptive, and are often illustrated through case studies rather than quantitative analyses (Fotaki 2011; McMullin 2025; Pestoff 2018; Souza and Neto 2018). This research gap is especially pronounced across diverse governance settings, such as crises versus routine governance scenarios, where policy mixes may have complementary or conflicting effects on individuals' behaviour (He, Dai, and Guo 2025; Rogge and Reichardt 2016). Consequently, examining how citizens respond to the institutional environment across different scenarios has emerged as a crucial research frontier.

To address the research gaps, we first redefine passive co-production as a distinct form of co-production from the perspective of policy implementation and compliance and then develop a theoretical model of passive co-production based on the IAD framework to examine how institutional environments shape passive co-production through the interaction of government deterrence and social norms. Through empirical testing combining a survey and a survey experiment in crisis and routine scenarios in China, the results reveal that deterrence and social norms significantly drive passive co-production under crisis scenario, whereas only social norms matter in the routine setting. Additionally, the interaction between deterrence and social norms varies across scenarios. By examining this relationship, our research provides a more nuanced understanding of the institutions in co-production, and contributes to the co-production literature by reconceptualizing passive co-production through the lens of policy compliance across different contexts and extending the IAD framework to passive co-production. It further provides policy implications for mobilizing co-production by revealing the potential paradoxical roles of government deterrence and social norms in shaping citizen behaviour.

The rest of this research begins by redefining passive co-production, providing a theoretical background, and proposing the hypotheses. It then describes the mixed-methods and results of the study, and concludes with a discussion of the findings, implications for practices, and directions for future studies.

Theoretical background and literature review

Evolution of the co-production concept

The rise of New Public Management reforms has fundamentally transformed the paradigm of public service delivery, positioning service users not merely as consumers and recipients but as key producers and contributors, distinct from traditional service providers like governments (Osborne, Strokosch, and Radnor 2018). This paradigm shift has popularized the concept of co-production, which emphasizes collaborative efforts between the state and citizens in producing public services (Osborne et al. 2022; Osborne, Radnor, and Strokosch 2016; Ostrom 1996). Central to these discussions is the recognition of citizens' value in the provision of public goods and services (Parks et al. 1981; Whitaker 1980), and co-production is now widely understood as a collaborative effort between traditional producers and consumer-producers (Brandsen, Steen, and Verschuere 2018; Nabatchi, Sancino, and Sicilia 2017; Osborne 2018; Osborne, Radnor, and Strokosch 2016).

The concept of co-production naturally involves two actors and introduces two contrasting approaches: the top-down approach from the state actors based on implementation, compliance, and efficiency, and the bottom-up approach from the lay actors, emphasizing decentralization, democratic values, voluntarism, and citizen empowerment. These contrasting approaches make co-production a critical mediator between the state and citizens (Kang and Van Ryzin 2019; Pestoff 2006). From the perspective of the classical paradigm of public administration, this concept encapsulates both the political dimension of citizen participation, focusing on equity, and the administrative dimension, emphasizing efficiency (Osborne and Strokosch 2013). Building upon this paradigm, scholars have proposed the ladder of co-production, which classifies different forms of co-production based on the level of power given to citizens by the state (McMullin 2025; Souza and Neto 2018).

However, the tension between the two approaches has also complicated the conceptual clarity of co-production, which often overlaps with policy implementation and is difficult to delineate clearly, leading to the ongoing debates regarding its classifications and measurements (Dudau, Glennon, and Verschuere 2019; Nabatchi, Sancino, and Sicilia 2017; W. H. Voorberg, Bekkers, and Tummers 2015). The conceptual ambiguity stems significantly from co-production's expansive application across public service phases, including co-design, co-delivery, and co-assessment (Verschuere, Brandsen, and Pestoff 2012), which often obscures distinctions between co-production and policy implementation. Moreover, there remains debate on whether passive co-production should be considered as co-production: one view argues it should be included due to its contributions to public value and its role in shaping the service delivery environment, while the opposing view

contends it should be excluded because of its limited voluntariness and the absence of active citizen agency (Brandsen and Honingh 2016; Brudney and England 1983; H. Li and Lu 2024; Sharp 1980; Tõnurist and Surva 2016). To resolve these debates, this research first clarifies these concepts and then redefines the concept of passive co-production through theoretical derivation.

Reconceptualizing passive co-production

In public policy, compliance generally denotes obedience to rules, regulations, laws, and policies established by authorities, focusing on obligations rather than rights (Im et al. 2014; Moynihan, Herd, and Harvey 2015; Young 2013). Therefore, compliance can be distinguished from co-production mainly in two aspects. First, compared to active co-production, policy compliance is often regulatory and mandatory through legal or administrative deterrence, such as fines, penalties, or sanctions (Huth and Russett 1990; N. N. Liu et al. 2015), and does not necessarily involve voluntary participation, as seen in tax compliance (Andreoni, Erard, and Feinstein 1998). Second, compared to passive co-production, compliance with policies usually aims at realizing private interests rather than public benefits, such as avoidance of legal penalties (H. Li and Lu 2024). Therefore, some scholars like Brudney and England (1983) suggested that passive co-production, as 'inaction based on compliance', lies outside the scope of true co-production.

To further clarify the three concepts, Table 1 provides a framework distinguishing active co-production, passive co-production, and compliance across five dimensions, which reflects the typical characteristics of citizen, government, and service delivery. First, from the perspective of citizens, the degree of voluntariness constitutes the core criterion. A choice is voluntary if and only if it is not made because there is no acceptable alternative to it (Olsaretti 1998). Therefore, compliance exhibits the lowest voluntariness. The choice to comply is driven by the need to avoid punishment or sanctions, meaning that the alternative of non-compliance is an unacceptable option. Active co-production, on the contrary, exhibits the highest voluntariness. The choice to participate is made based on their free will, while the

Table 1. Conceptual distinctions among active co-production, passive co-production, and compliance.

	Active co-production	Passive co-production	Compliance
Degree of Voluntariness	High	Low	Low
Primary Motivation	Intrinsic	Mixed	Extrinsic
Citizens' Role	Partner/Initiator	Contributor	Implementer
Government Intervention	Low/Citizen-led	High/State-led	High/State-led
Value Creation	Community-centred	Mixed	Self-centred

alternative of not participating remains a perfectly acceptable option. Passive co-production occupies the middle ground with low but variable voluntariness. Its degree is contingent on whether external pressures render the alternative of non-participation unacceptable.

This continuum of voluntariness between the three concepts is closely mirrored by citizens' primary motivation to co-produce and their role in co-production. In one respect, their motivation ranges from extrinsic (e.g. fear of sanctions) in compliance, to mixed motives in passive co-production, and to primarily intrinsic (e.g. civic duty, altruism) in active co-production. Correspondingly, citizen's role shifts from an implementer of public policy, to a contributor, to an empowered partner and even an initiator in service delivery.

From the government's perspective, we could further distinguish these concepts by the level of intervention. Active co-production is typically citizen-led with low state intervention. In contrast, both passive co-production and compliance are usually state-led, characterized by high levels of government intervention and oversight.

Finally, from the perspective of service delivery process, these concepts could be distinguished by their intended value creation. Compliance is typically self-centred and primarily generates private value. In contrast, active co-production is distinguished from compliance by creation of public value (e.g. contributing to community goals or public health), while passive co-production occupies a more mixed space, where citizen participation contributes to both private and public value.

However, this research posits that while policy compliance and co-production remain distinct constructs, they may overlap to some extent (Alford 2009). Emphasizing the element of 'voluntary' in co-production may be too restrictive and idealistic (Brandsen and Honingh 2016). Although the motivations may vary, citizens' deliberate behaviours, such as workplace donations and state-led volunteering, may also enhance service quality and contribute to public value creation. Therefore, in line with existing studies (Brandsen and Honingh 2016; Nabatchi, Sancino, and Sicilia 2017), co-production in this research is broadly understood as state actors and (groups of) citizens working together to contribute to public services, regardless of the voluntariness of participation. In this sense, co-production can be viewed as a specific subset of citizen participation that contributes to the process of public services while citizen participation is a broader concept encompassing a wide range of political behaviours, such as voting or advocacy.

Figure 1 shows the structural parallels between the traditional model of service delivery (Figure 1(a)) and policy implementation (Figure 1(b)). The success of policy implementation depends on citizens' cooperation and support, just as the provision of public services cannot be effective without

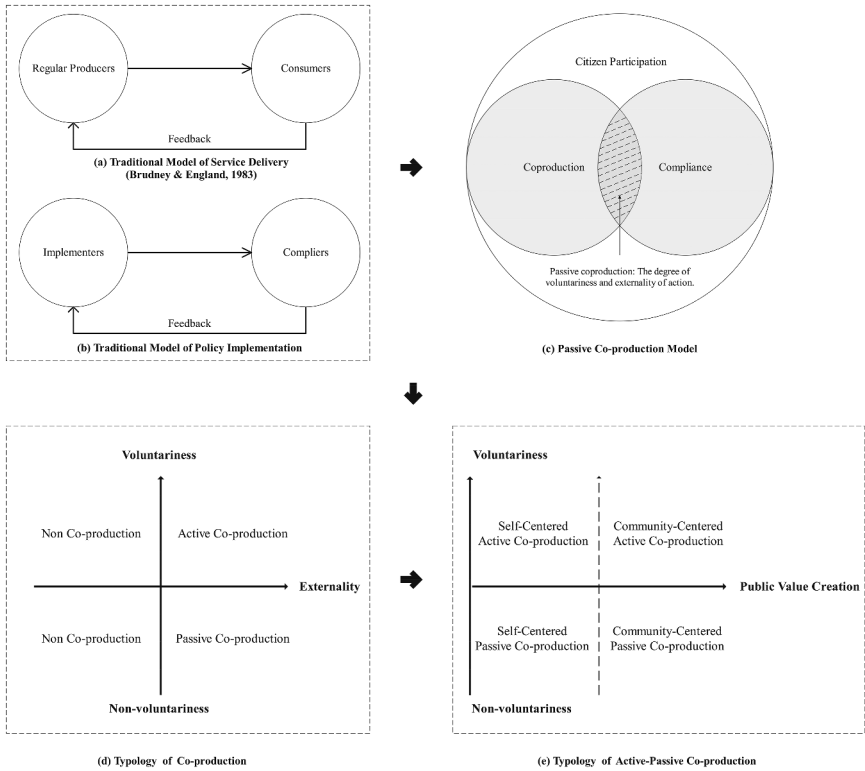

Figure 1. Reconceptualization of passive co-production.

citizens' contributions. Co-production theory thus offers a valuable lens for examining policy compliance behaviours, demonstrating citizens' critical role in the policy process. Such compliance behaviours can also generate strong positive externalities and extend beyond private gains. This is particularly pronounced during public crises, when there is a heightened societal demand for citizen collaboration (Carminati, Cavenago, and Mariani 2022). For instance, citizens can contribute to public health outcomes by voluntarily reducing visits to public spaces and using public transportation (e.g. staying at home), achieving both private (personal health) and public (community health) benefits (H. Li and Lu 2024).

Therefore, passive co-production is captured as the overlap between co-production and policy compliance as indicated in Figure 1(c). It is characterized by two main features: voluntariness and externality. First, involuntariness reflects the core feature of policy compliance, resulting from an unequal power dynamic between the co-production actors. While the literature often idealizes co-production as citizens' voluntary and active behaviours, individual motivations are complex, and many ostensibly voluntary

actions inherently contain elements of coercion, which is a prevalent and critical phenomenon in practice that should not be overlooked. Second, the positive externality showcases the core attribute of co-production, where the benefits extend beyond individual gains, contributing to collective welfare and public value (Alford 2014).

Figure 1(d) displays the typology of co-production from voluntariness (coerced to voluntary) and externality (negative to positive). Based on these two dimensions, co-production can be divided into four quadrants, including active co-production, passive co-production, and non co-production. Rich's (1981) foundational typology divides co-production into active and passive according to action or inaction. He posited that, as intentional or unintentional inaction, passive co-production can have either positive or negative consequences, such as failure to report crimes or remove fire hazards, yet active co-production requires conscious action and may also have either negative or positive consequences, such as littering or volunteering. However, this research contends that co-production is a cooperative behaviour that creates public value. Therefore, inaction or action that results in negative externalities, such as littering, should be excluded from the conceptual boundary of co-production, as shown in the second quadrant and third quadrant of Figure 1(d).

In contrast, we conceptualize co-production as a continuum of citizen participation that includes not only voluntary and proactive engagement (active co-production) but also involuntary and coercive behaviours (passive co-production), which all yield positive externalities and public value. Building upon prior work that conceptualized citizens complying with policies as manipulative co-production (Souza and Neto 2018) or citizens taking responsibilities as enforced co-production (Fotaki 2011; McMullin 2025; Pestoff 2018), this research redefines passive co-production – from the perspective of policy compliance – as a distinct form of co-production with limited voluntariness, which is driven by external compulsion, coercion, or normative pressure, yet still contributes to public value creation. For instance, citizens' compliance with pandemic prevention measures, such as staying at home during lockdowns or self-quarantine, which is primarily driven by policy mandates, social pressures, or fear of sanctions. Although such actions often lack strong personal voluntariness, they constitute collaborative contributions to public value and thus merit inclusion within the boundary of co-production.

Therefore, we further introduce the dimension of public value creation, the concept that focuses on the appraisal of activities, actions, and outcomes (Nabatchi 2018), to better reflect the positive externalities of co-production since co-production is intended to co-create public value through better use of each other's assets and resources (Bovaird and Loeffler 2012). Building on prior studies, value creation can range from

self-centred value – such as self-development and personal benefit – to community-centred value, such as social, environmental, or political impact (Benington and Moore 2010; Bovaird and Loeffler 2012; Jaspers and Steen 2021; Van Eijk and Steen 2016). Hence, we can conceptually distinguish between self-centred behaviours, which generate lower public value and prioritize user interests, and community-centred behaviours, which produce higher levels of public value and reflect altruistic intentions. As a result, by integrating the dimension of public value creation (low vs. high) with voluntariness (low vs. high), this yields a refined typology of active-passive co-production (see Figure 1(e)) that includes four types:

- Self-centred active co-production (e.g. time banks, mutual aid platforms aimed at reciprocal benefit)
- Public-centred active co-production (e.g. volunteering, civic advocacy driven by normative goals)
- Self-centred passive co-production (e.g. workplace donations, state-led campaigns mainly to gain recognition or career rewards)
- Public-centred passive co-production (e.g. complying with pandemic prevention, waste sorting)

The continuum from active to passive and from self-centred to community-centred co-production is also dynamic and transformative since individuals' motivations to co-produce are often mixed. Co-producers may experience tensions between different dimensions of public value as they are not solely driven by self-interest or altruism, but by a mix of intrinsic and extrinsic motivations (Jaspers and Steen 2021). For example, passive co-production, initially driven by external enforcement or deterrence, may evolve into active co-production over time when individuals address information asymmetries, gain firsthand experience in the process of co-production and co-creation. Mechanisms such as experiential learning, motivation activation, or recalibration of the cost–benefit may cultivate a citizen to become an active co-producer and gradually shift participants from passive compliance to voluntary engagement.

In summary, this active-passive co-production typology bridges coercive compliance and collaborative governance, offering a nuanced lens to analyse how state power and citizen participation jointly shape societal outcomes. By integrating public value creation and voluntariness, this refined typology extends the co-production theory beyond idealized notions of voluntarism.

Institutional environment and passive co-production

Institutions constitute the primary arena for state-citizen interactions, creating the external environment that includes the critical factors in the involuntary aspect of passive co-production. Developed by Elinor Ostrom (2009, 2011), the Institutional Analysis and Development (IAD) framework provides a structured lens for examining how institutions govern actions and outcomes within collective action settings. The framework emphasizes that institutions should be understood as contextual in nature, and interactive with the various cultural and biophysical attributes of the arenas in which they are applied (Ostrom, Gardner, and Walker 1994; Siddiki 2011). Using the IAD framework, existing studies have indicated the significant role of institutional tools on individuals' behaviours, such as compliance (Ostrom 2009; Siddiki, Basurto, and Weible 2012; Villamayor-Tomas et al. 2015).

According to the IAD framework, the institutional environment shaping co-production can be drawn primarily from two elements: formal institutional rules and informal social norms. Institutional rules, operating as deterrence mechanisms, provide the basis for incentives and constraints that shape both the opportunities and limitations for passive co-production (Kiser 1984). Complementing these rules are social norms – a new and softer governance approach aligned with the perspective of Nudge or Libertarian Paternalism (Sunstein and Thaler 2003). These norms represent a collective understanding or consensus among community members regarding the institutional rules and may affect the effectiveness of institutional arrangements by influencing how efficiently and cohesively the rules are implemented and adhered to within the community.

Government deterrence and passive co-production

Governments play a decisive role in shaping passive co-production through their monopoly on policy instruments. Early research on co-production in the context of public safety revealed that citizens were not merely consumers of police services but also essential co-producers of community safety as a part of groups formed through policy initiatives (Percy 1978; Rosentraub and Harlow 1983). Existing studies also indicate that passive co-production can be encouraged through compulsion, coercion, and educational and persuasive tactics from government authorities (Folz and Hazlett 1991; Han and Baird 2022; Souza and Neto 2018; Tõnurist and Surva 2016), which implies the important role of governments in mobilizing citizen co-production.

The deterrence theory, originating from Becker's (1968) classic work on crime, provides a vital perspective through which passive co-production is understood among government initiatives. This theory posits that the certainty and severity of punishment serve as deterrents, leading rational

individuals to comply with regulations. When the expected benefits of violating rules outweigh the costs, individuals are more likely to engage in non-compliant behaviour. Empirical studies have widely confirmed that the certainty, or the perceived probability of being caught and punished, and the severity of the punishment are critical to deterrence effectiveness (Corman and Mocan 2000; Ehrlich 1973; Lott and Mustard 1997). For example, the UK's 2020 Health Protection Regulations empowered police to impose fines of £100 to £3,200 to curb COVID-19 transmission, with immediate actions to enforce co-production through arrests when necessary.

Governments frequently employ these regulatory and coercive policy instruments, yet these tools face persistent challenges related to legitimacy, inefficiency, ethical concerns, and unintended consequences. Such measures may risk infringing on individual autonomy and freedom, eroding public trust, and reducing policy acceptance (Eliadis, Hill, and Howlett 2005; Mill 1998; Treger 2023; Vedung 1998). In the context of co-production, these instruments may exacerbate power imbalances, constrain genuine empowerment, and challenge fundamental democratic principles of equality and fairness in co-production and value co-creation (Brix, Krogstrup, and Mortensen 2020; Evers and Ewert 2021; Loeffler and Bovaird 2021; McMullin 2025; Osborne, Radnor, and Strokosch 2016).

Building on these theoretical insights and empirical evidence, this study contends that enhancing the perceived certainty and severity of punitive measures can serve as effective short-term deterrents to promote citizen participation in co-production. By increasing the perceived costs of non-cooperation (Huth and Russett 1990), such measures may overcome initial resistance despite their potential limitations. Based on this rationale, the following hypothesis is proposed:

H1: Government deterrence will promote passive co-production.

Social norms and passive co-production

Beyond formal state mechanisms, communities exert informal normative pressures that may regulate passive co-production. Social norms, typically defined as shared understandings about actions that are obligatory, permitted, or forbidden, are integrated into institutional rules to influence co-production (Crawford and Ostrom 1995). Leveraging the conformity psychology, social norms have been widely demonstrated to motivate co-production by disclosing the compliance and approval of the target behaviour among the majority of community members (Abrahamse and Steg 2013; Agerström et al. 2016; Allcott 2011; Dvir 2024; Farrow, Grolleau, and Ibanez 2017; Neville et al. 2021; G. Wang et al. 2025).

Social norms play a pivotal role in shaping citizens' co-production preferences, values, and behaviours by influencing both internal and external

motivations. Internally, failing to follow social norms, such as keeping a promise, can generate intrinsic cost or anguish, referring to feelings of guilt when self-inflicted or shame when the knowledge of the failure is exposed to others (Ostrom 2000; Posner and Rasmusen 1999). For instance, Allcott (2011) found energy conservation norms reduced U.S. household consumption by 2% through peer comparison disclosures. Externally, social norms may also operate under the pressure of a set of rules and a system of monitoring and sanctioning (Ostrom 2000). Citizens may engage in co-production out of fear of non-conformity and to gain acceptance and recognition from peers or the community (Cialdini, Reno, and Kallgren 1990; Schultz et al. 2007). Therefore, the second hypothesis is proposed:

H2: Social norms will promote passive co-production.

The interplay of government deterrence and social norms on passive co-production

Policy mixes can also have a complex interplay on individual behaviour and the influence of social norms may reinforce the effectiveness of government deterrence on passive co-production. In contexts where social norms are more prominent, citizens may feel greater social pressure to conform to collective expectations, enhancing their responsiveness to co-production initiatives by government (Cialdini, Reno, and Kallgren 1990). In other words, when there is a high degree of normative pressure from the community or peers, individuals are more likely to align their behaviours with public standards due to a desire for social acceptance or fear of social disapproval. This normative environment can amplify the perceived legitimacy and effectiveness of government deterrence efforts, as citizens not only seek to avoid formal sanctions but also the informal social consequences associated with non-compliance (Alm, Jackson, and McKee 2009; Frey and Torgler 2007). Thus, government deterrence measures, such as fines or public shaming, may have a heightened effect on motivating co-production when supported by strong social norms. Based on this rationale, the following hypothesis is proposed:

H3: Social norms moderate the effect of government deterrence on passive co-production, with stronger norms amplifying the positive effect of deterrence.

Theoretical framework for passive co-production

Drawing on the IAD framework and existing literature on deterrence and social norms, Figure 2 presents the theoretical framework for passive co-production. In the co-production of public goods and services, citizens are embedded within an institutional environment, including formal

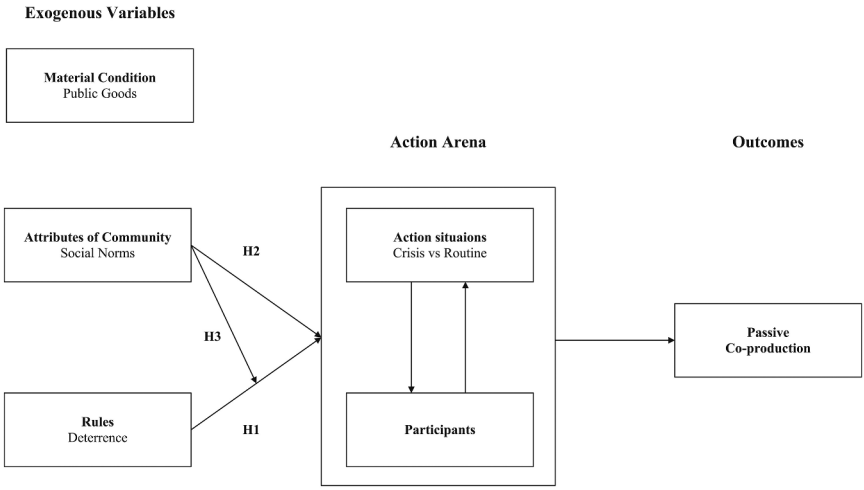

Figure 2. Theoretical framework for passive co-production.

institutional rules (legal/administrative structures imposing deterrents, e.g. fines, mandates) and informal social norms (community expectations that internalize or resist state objectives). The interaction between these external forces may influence citizens' perception and judgement of the costs/benefits of cooperation within specific action situations (crisis or routine scenarios), ultimately shaping their willingness and behaviours towards co-production.

In conclusion, this theoretical framework clarifies how passive co-production is shaped by the institutional environment that aligns individual rationality with policy goals of public service provision. In addition, it provides a critical lens for analysing state-led co-production and for understanding government-citizen interactions in public service delivery and public value co-creation.

Research methods

Empirical context: institutional environment and co-production in China

China's unique institutional environment provides a distinctive setting to examine the theoretical framework for passive co-production. In China, the institutional environment significantly shapes passive co-production. The state's dominance in governance, coupled with a constrained and relatively weak society, positions the Chinese government as the primary initiator of passive co-production, such as top-down initiatives to mobilize members of the Communist Party of China to volunteer and to enforce workplace charitable donations (Weng and Zhang 2020). These state-led initiatives

often place citizens in a passive role, in which their participation is largely driven by governmental directives, with state power playing a very active role in initiating, funding, and facilitating the co-production process (B. Li et al. 2019; Tu 2021; J. Wu and Xiong 2022).

Additionally, China's cultural fabric further enmeshes institutional pressures with social imperatives on passive co-production behaviours, particularly through tools like *mianzi* (面子, reputation/self-image) and *guanxi* (关系, reciprocal relationship) to enforce conformity (Qin and Owen 2021). For instance, many local residents' committees in China may publicly shame households violating waste-sorting, invoking reputational costs, or mobilize community leaders to pressure non-compliant neighbours via interpersonal ties to mobilize residents to co-produce through interpersonal networks. These tactics exploit collective identity, aligning individual behaviours with majority practices to avoid ostracism.

Under this collectivist culture, social norms act as a parallel governance mechanism, reinforcing state directives by intertwining participation expectations with cultural values (Pestoff 2018). The interplay of institutional coercion and socio-cultural pressures creates a unique ecosystem where citizens engage in co-production not out of civic duty but to navigate reputational risks or relational obligations. Therefore, by analysing how formal rules and informal norms jointly shape citizen co-production, China serves as an exemplary setting to test how institutions shape citizens' passive co-production.

Research scenarios

To validate the theoretical framework for passive co-production, this research examines two distinct public service scenarios in China following existing research (B. Liu et al. 2023): pandemic prevention as a crisis scenario and garbage classification as a routine context, in which citizen participation is structured more by top-down directives and socio-cultural pressures than by voluntary engagement. Given that the institutional environment may exert stronger effects on passive co-production during public crises, study 1 first tested the theoretical framework in the context of COVID-19 pandemic prevention. To further test the framework beyond crisis conditions, study 2 then selected garbage classification as a causal test in routine governance settings. This comparative approach enables robust evaluation of whether the framework maintains its explanatory power across different policy contexts.

These two public service scenarios offer distinct yet complementary settings to examine the stability and generalizability of the theoretical framework on institutional environment and passive co-production. On one hand, both scenarios are initiated, funded, and enforced by the state,

reflecting the typical features of passive co-production. On the other hand, the COVID-19 pandemic represents an extreme test of institutional coercion, where urgency amplified state authority, while garbage classification illustrates how routine policies normalize passive participation through sustained bureaucratic and cultural pressures. In the state-led approach where the government plays a dominant role in agenda setting, policy design, and implementation, citizens have limited autonomy or power in the service delivery processes, and participation is motivated or constrained by administrative or social pressures. Together, these two scenarios offer a comprehensive foundation to test how the institutional environment shapes co-production with limited voluntariness across different governance settings.

Study 1: public crisis of COVID-19 pandemic prevention

The COVID-19 pandemic exemplifies how public health crises necessitate co-production, as citizens become critical actors in containing the spread of the virus by keeping social distancing and wearing masks (Bovaird 2007; Y. Wu, Xiao, and Yang 2022; Zhao and Wu 2020; Zhao et al. 2024). In China, pandemic prevention evolved into a state-led co-production paradigm. Despite voluntary actions and collaborations also existing during the pandemic (Cheng et al. 2020; Zhao and Wu 2020), the state dominated the co-production process by enforcing and regulating citizens' participation through strict administrative measures, including complete lockdown, mandatory nucleic acid testing and quarantines, and intensive surveillance systems. Therefore, citizens' co-production behaviours were largely shaped by institutional and social pressures rather than voluntarism, thus providing a suitable context to test how deterrence and social norms interact to shape passive co-production during crises.

Study 2: routine setting of garbage classification

Garbage classification has become a main focus of China's environmental governance in recent years, aligning with its carbon neutrality goals under the 'Ecological Civilization' framework (Kuang and Lin 2021). In this routine setting of governance, citizens are encouraged to take a role in sorting household waste and spreading awareness about the regulations and policies of garbage classification, positioning them as both implementers and co-producers in routine local governance (B. Liu et al. 2023). However, citizens often lack intrinsic motivations to co-produce based on rational choice, given the high perceived costs (e.g. time, effort, confusion over categories) and low perceived benefits.

To mobilize citizen co-production, local authorities often utilize 'hard' coercive measures such as surveillance cameras and fines, and leverage 'soft' collective norms within the community (Qin and Owen 2021). Failing to co-

produce may result in a loss of both money and social dignity (Buckley, Clegg, and Tan 2006). Thus, characterized by low voluntariness and high external incentives, citizen co-production in garbage classification occurs predominantly under strong institutional pressures rather than intrinsic motivation, making it a typical context to test how the institutional environment shapes passive co-production, when isolating the crisis-driven urgency.

Research design

Study 1: survey

In study 1, the survey method was used to test the theoretical model. The dependent variable of the questionnaire was co-production in COVID-19, measured by the degree of compliance with stay-at-home orders. To mitigate the social desirability bias, the study incorporated a scale consisting of three items that assessed their co-production behaviour. Independent variables are deterrence, measured by the occurrence of police in communities, and social norms, measured by the perceptions of co-production behaviour of others. The control variables include gender, age, education level, marital status, and household registration. Table A1 (see the Appendix) provides specific measurements of each variable. After informed consent, each participant took about 9 minutes to complete the questionnaire.

Study 2: online survey experiment

Study 2 used an online survey experiment to further verify the findings in study 1 and explore the causal effect in a routine scenario by manipulating the independent variables and randomly assigning study subjects.1 Specifically, study 2 employed a 3 (Deterrence: High/Low/None) × 3 (Social Norms: High/Low/None) between-subjects factorial design. Participants were randomly assigned to one of the nine experimental scenarios (see Table A2 in the appendix).

Figure 3 shows the flow of the experiment. The experiment began by informing the participants about the content, objectives, and rewards of the experiment, and proceeded with their informed consent. Following an attention test, participants were asked to read materials about the background of garbage classification. Then, participants were asked to imagine that they were an ordinary citizen in City S, and they were participating in the community's garbage classification.

Based on the background, this study demonstrates the experimental manipulations using a household garbage classification report. The complete stimulus material is shown in Figure A1 and Figure A2. Study 2 manipulated deterrence in the experiment by describing the supervision frequency of government-advised community workers and the punishment measures, including a control group (no deterrence information) and two experimental

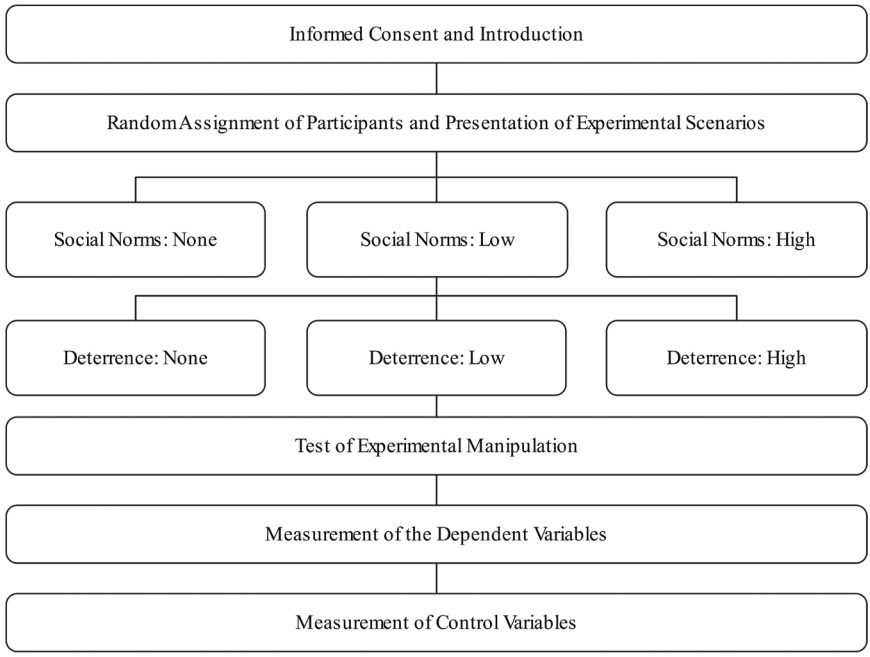

Figure 3. Flow of the survey experiment in study 2.

groups with high and low levels of deterrence. Similarly, social norms were manipulated by employing a comparative approach adopted from existing research (Allcott 2011; Bonan et al. 2020), with one control group (no information on social norms) and two experimental groups representing high and low levels of social norms. The low social norms group set a recycling amount of 7.5 kg, which is 40% less than the top households' 12.5 kg benchmark, while the high social norms group set a recycling amount of 2.5 kg, which is 80% less than the top households.

After the manipulation, participants were first required to answer comprehension questions about the measurements for deterrence and social norms that they saw, checking their understanding of the manipulation to ensure the effectiveness of the experimental intervention. Participants can only proceed if they have provided the correct answers. Then the dependent variable and control variables were measured. Due to the traits of a survey experiment, the study used co-production willingness as the measurement of the dependent variable by asking: 'If you were a resident of this community, what is your willingness to participate in garbage classification this month?' To mitigate the social desirability bias, a 7-point Likert scale was adopted, and the co-production willingness of others was also measured based on existing research (Nederhof 1985). Participants were asked to assess

the willingness of others, allowing them to project their true attitudes more freely by the indirect questioning and providing a less biased proxy for their own willingness (Fisher 1993).

Additionally, Table A1 details the measurements of co-production willingness and other key variables, and Table A3 shows the balance test. It was confirmed that there were no significant differences among the nine groups for control variables, suggesting the effectiveness of the random assignment.

Participants

The samples of both studies were recruited from Credamo (www.credamo.com.), an online survey platform that could provide professional online survey service and nationwide randomized online experiments.2 In study 1, participants were recruited in the political centre of China, Beijing, and two nearby provinces: Hebei and Liaoning, during the COVID-19 pandemic in October 2021, covering 26 cities. A total of 1000 valid questionnaires were collected. Participants for study 2 were recruited in July 2024.3 A total of 1618 valid responses were collected, covering 31 provincial-level administrative units in China. Each participant was paid 1–2 CNY for completing the survey. The demographic characteristics of the two samples and the Chinese population are shown in Table A4. Notably, due to the traits of the online platform, the samples may over-represent the demographic characteristics of online citizens in China who are relatively younger, and have received college and above-level education.

Table 2. The analysis results of the effect of institutional environments in study 1.

	Model 1	Model 2
Deterrence	.010*** (.002)	−.038* (.023)
Social norms	.013** (.005)	−.016 (.014)
Deterrence × Social norms		.011** (.005)
Age	.008** (.003)	.008*** (.003)
Education	−.005* (.003)	−.005* (.003)
Gender (Reference: Male)		
Female	−.012** (.005)	−.011** (.005)
Others	.005 (.068)	.007 (.068)
Residence (Reference: Rural)		
Urban	−.032*** (.005)	−.032*** (.005)
Marital status (Reference: Single)		
Married	.001 (.006)	.001 (.006)
Others	.028 (.029)	.025 (.029)
Number of observations	1000	1000
R^2	.098	.102
Adj R^2	.089	.093

Note: *$p < .1$, **$p < .05$, ***$p < .01$; Standard error in parenthesis.

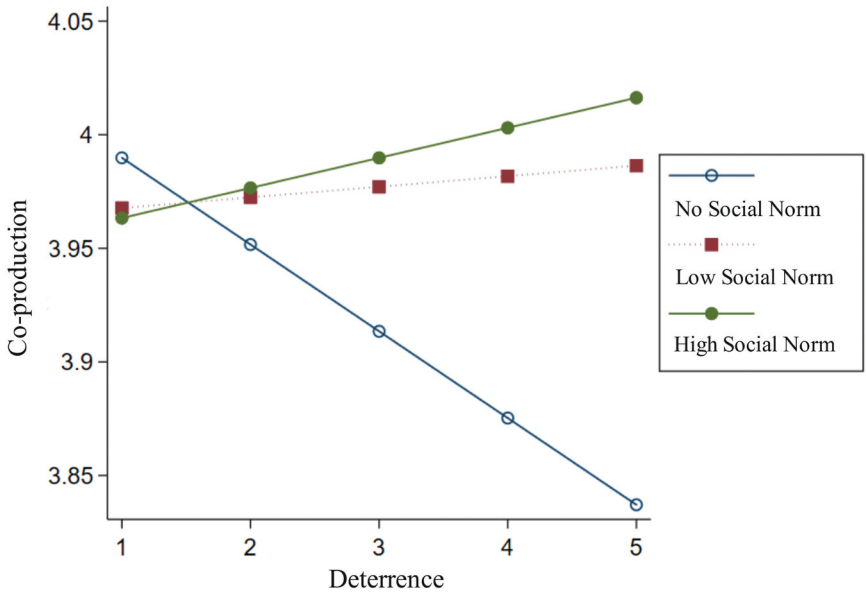

Figure 4. The interaction of deterrence and social norms on co-production in study 1. Note: High/low social norms were divided based on mean ± one standard deviation; no social norm was set at social norm = 0.

Results

Regression analysis of study 1 (crisis scenario)

Study 1 first tested the hypotheses in a public crisis scenario using OLS regressions with demographic variables controlled. As shown in Table 2, government deterrence and social norms have significant positive effects on co-production in COVID-19, supporting H1 and H2. Specifically, higher levels of government deterrence and stronger perceived social norms significantly promoted citizens' engagement in complying with stay-at-home orders. It suggests that coercive measures, when perceived as legitimate and necessary, especially during a crisis, can enhance citizen engagement rather than merely provoking fear or resistance.

Moreover, there is a significant interaction effect between deterrence and social norms on passive co-production as shown in Model 2 (Coefficient = 0.011, $p < 0.05$). To verify the interaction effect, study 1 further conducted a simple slope test. As shown in Figure 4, deterrence has a negative effect on passive co-production in the absence of social norms, with this effect shifting from negative to positive and growing significantly stronger as social norms strengthen. This transformation suggests that social norms may provide a context that reframes deterrence from a merely coercive tool into

Table 3. Results of two-factor ANOVA in study 2 ($n = 1618$).

	Co-production Willingness			Co-production Willingness of Others		
	SS	F	P value	SS	F	P value
Deterrence	1.015	.450	.637	.587	.230	.791
Social norms	8.034	3.570	.028	14.843	5.920	.003
Deterrence × Social norms	2.124	.470	.756	21.082	4.200	.002
Residual	1810.096			2017.629		
R^2	.006			.018		

a legitimate and supportive mechanism for collective action. This result indicates a positive moderation effect of social norms, supporting H3.

ANOVA of study 2 in routine scenario

Study 2 employed two-factor analysis of variance (ANOVA) to test the hypotheses in the routine scenario, as shown in Table 3. Since the participants in each group were randomly assigned and demographic statistics were balanced across groups, any differences in co-production willingness across groups can be attributed to the treatment effect of the experimental intervention.

As shown in Table 3, the results indicate that the main effects of social norms on co-production willingness and co-production willingness of others are significant ($F = 3.57$, $p < 0.05$; $F = 5.92$, $p < 0.01$), aligned with results in study 1. The higher the perceived social norms, the more likely citizens are willing to engage in co-production. Notably, the co-production willingness of others may be more likely to reflect participants' real attitudes and willingness after mitigating the social desirability bias. Differing from study 1, the main effect of government deterrence is not significant ($F = 0.45$, $p = 0.64$; $F = 0.23$, $p = 0.79$), implying the limited effectiveness of deterrence in the routine setting. In addition, the interaction effect between deterrence and social norms on co-production willingness of others is also significant ($F = 4.20$, $p < 0.01$).

To further verify the interaction effect between government deterrence and social norms on co-production willingness of others, a simple slope test was conducted (see Figure 5), and the means across the nine experimental groups were presented in Table A5. The result shows that deterrence has a weaker effect on co-production willingness of others for people with a higher perception of social norms. This implies a negative moderation effect of social norms, in contrast to study 1. As a result, the combination of high social norms and low deterrence results in the highest level of willingness to co-produce. Citizens' intrinsic motivation to co-produce may be activated by high normative expectations in routine scenario, and thus excessive coercive pressure may not only be unnecessary but

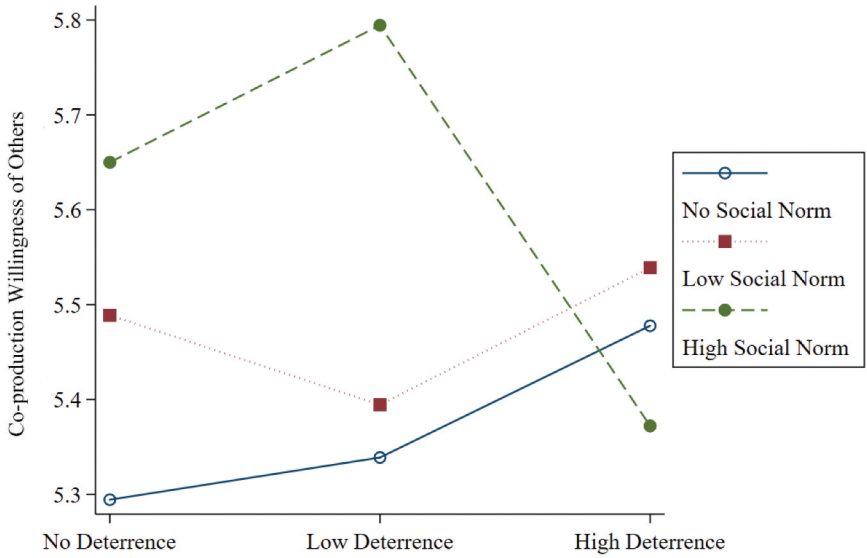

Figure 5. The interaction of government deterrence and social norms on co-production willingness of others in study 2.

counterproductive. Moreover, the impact of deterrence on co-production exerts an inverted-U shape in high social norms group, indicating that excessive deterrence may even crowd out motivation to co-produce instead.

Discussions and conclusions

Co-production, emerged as a critical perspective in governance, embodies the integration of democratic values into public service delivery and policy implementation (Pestoff 2006). However, the phenomenon of passive co-production, mainly driven by external interventions and shaped by the institutional environment, remains widespread yet underexplored. Therefore, this research first redefines passive co-production from the perspective of policy compliance and develops a theoretical model based on the IAD framework. Through a multi-method approach combining a survey and a 3 × 3 between-subject survey experiment, this research investigates two key scenarios in China: COVID-19 prevention and garbage classification. The findings reveal that in public crisis settings, government deterrence and social norms both significantly promote passive co-production, with their interaction effects mutually reinforcing passive co-production. In routine settings, while social norms continue to exert a significant positive influence on passive co-production, the impact of government deterrence is insignificant. Moreover, high levels of social norms weaken the positive effect of government deterrence on passive co-production, and excessive deterrence

may even crowd out citizens' willingness to co-produce, indicating the limited and even negative effects of coercive policy instruments.

These findings reveal a contextual dependence and complex interactions of policy instruments on passive co-production. Their effectiveness may be conditional depending on the crisis or routine governance contexts. For instance, in routine scenarios, where the immediate risks are low, high government deterrence may be perceived as intrusive, disproportionate, or even illegitimate. Rather than fostering a sense of security, coercive interventions in such contexts are more likely to provoke fear, resentment, or resistance, thereby crowding out co-production, which aligns with existing research on the potential backlash of strict sanctions and threats (Williamson et al. 2022).

This research makes several important contributions to the literature. First, this research clarifies and discusses the core element of 'voluntariness' in co-production and redefines the concept of passive co-production, emphasizing the tension between involuntariness and positive externality in co-production, which delineates the boundary of co-production and enhances our understanding of its voluntariness continuum. While citizen-led or citizen-owned co-production has often been seen as the ideal or 'best' type of co-production, where citizens have the power to realize what they want for their community (Arnstein 1969), there remains doubt as to whether the inputs of states and citizens are complementary or substitutive, especially for the passive form of co-production (McMullin 2025; Ostrom 1996). It may signal a shift in responsibility, where citizen contributions risk becoming substitutes for professional inputs, especially when citizens are expected to fulfill the roles traditionally held by the states. Thus, it makes a theoretical contribution to the understanding of government-citizen collaborations in public service delivery, by highlighting the power imbalance within passive co-production, especially in contexts like China, where the state could exert considerable influence over citizens. This may also provide insights for countries where the pressures to focus on efficiency have often surmounted a focus on collaboration, partnership, and community empowerment (McMullin 2025).

Second, the research findings highlight the complex dynamics of institutional environment factors by empirically testing the IAD framework in passive co-production contexts, demonstrating that the interactions among the government, society, and individuals may often lead to passive co-production. More importantly, the findings illustrate that although deterrence can temporarily alter citizen behaviour through punishment but may lose effectiveness in routine governance and may pose threats to citizens' long-term trust in government, consistent with existing research (Tõnurist and Surva 2016). This underscores the critical value of voluntariness in co-production. Social norms, by contrast, reflect collective values, especially in

China's tightly-knit social structures and collective consciousness cultures. It suggests that fostering community values may promote co-production more effectively across various contexts, which aligns with the idea of 'govern by contract' (Lascoumes and Le Gales 2007). In practice, policymakers should therefore seek both instrumental and democratic ends in their efforts. Coercive policy instruments should be used with caution, particularly in routine co-production. In other words, government officials should transcend their traditional enforcement roles by repositioning themselves as facilitative partners, sharing power with citizens and investing in digitalization, public education, civic capacity building, and collaborative community initiatives to enhance public value co-creation (Ahmad and Esposito 2024; Ahmad, Esposito, and Ali 2025).

However, this research is not without limitations. Firstly, the data were collected through an online platform, relying primarily on self-reported behaviours and intentions, which may be subject to social desirability bias and thus may represent a tendency more than actual behaviour of the general population. Moreover, the use of online platform may also limit the generalizability of the findings to populations without internet access. The younger and more-educated individuals in our sample may have a distinct orientation towards state intervention, potentially exhibiting a lower tolerance for coercive tools like deterrence. Future studies testing the robustness of our findings across different societal groups may provide new insights. Secondly, due to contextual differences, the design and measurements also differ between the two studies, which limits the ability to make causal inferences. Future research could consider employing different samples and field-experimental designs to replicate our findings.

In addition, while the IAD framework offers a powerful lens for understanding how institutional environment shapes individual behaviour, our study only applies it at the first-tier level as a macro-guiding structure. This may oversimplify the complex interplay between state actors and citizens in different cultures, and neglects questions of asymmetric power and collective evaluation (Cole, Epstein, and McGinnis 2019). Therefore, the framework could be extended by linking the social-ecological systems (SES) framework to enhance the explanatory power and unpack deeper mechanisms. In particular, while this study focuses on institutional pressure, or the 'stick' approach, future work could consider the role of positive institutional stimuli, including both material (e.g. economic rewards) and non-material incentives (e.g. reputation, recognition, moral appeals), which may also serve as important drivers of passive co-production (Barbera et al. 2025; W. Voorberg et al. 2018).

Moreover, whether the 'carrot' approach can be more effective than the 'stick' approach in promoting passive versus active co-production remains to be answered. Although passive co-production has crucial meaning for

understanding the dynamics of citizen power and participation, theoretical and empirical studies comparing passive and active forms of co-production remain scarce. For instance, whether different mixes of policy instruments produce similar effects across passive versus active co-production scenarios is also worth exploring. Comparative designs examining the differential effects of institutional environments could provide valuable theoretical and practical insights into co-production dynamics and the strategic design of public policies.

Despite the limitations, this research provides a meaningful answer to the fundamental question in co-production: Is co-production always active? By conceptualizing and examining the concept of passive co-production, we offer a novel analytical perspective for future studies that connects co-production with policy compliance when interpreting citizens' inputs. Our findings not only help delineate the boundaries of co-production but also call for a re-evaluation of the state-society relationship and the evolving role of citizens in contemporary governance. While co-production is often seen as a paradigm shift from management to governance, passive co-production represents a tendency towards a more state-led logic, where top-down intervention is used to achieve policy goals. It resurrects the classic tension between efficiency and equity. While passive co-production may be efficient in securing compliance for specific services, it prompts critical questions about its long-term consequences, since citizens' conscious engagement may be vital for public service delivery and public value co-creation in collaborative governance (Ahmad and Esposito 2025; Jiang and Fan 2024). Does it foster genuine civic engagement or merely temporary compliance? What are the effects on public trust and service quality when citizens feel compelled rather than inspired to participate? Does it risk turning citizens into mere instruments for policy objectives, or could it, conversely, cultivate a sense of civic duty that lays the foundation for future active co-production? Investigating these trade-offs provides a crucial agenda for future research.

Notes

1. The experiment was preregistered at the OSF site for the project (https://osf.io/bczjq/?view_only=80362b46e1464ad998c940488d57a348).
2. Credamo is a professional online data collection platform in China with a respondent pool of over 3 million registered users. It employs multiple mechanisms to control the quality of responses and collects surveys from prequalified users based on the screening conditions set by researchers. The platform has been increasingly used in research for its data reliability and sampling flexibility (e.g. Wang et al. 2025; Wang, Zhang, and Zhang 2025).

3. G*Power was used to compute the minimum sample size required for the experiment. Based on the power analysis, the minimum required sample size for this study is 252 (power = 0.9, significance level = 0.05, medium effect size = 0.25).

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References

Abrahamse, W., and L. Steg. 2013. "Social Influence Approaches to Encourage Resource Conservation: A Meta-Analysis." *Global Environmental Change* 23 (6): 1773–1785. https://doi.org/10.1016/j.gloenvcha.2013.07.029

Acar, L., T. Steen, and B. Verschuere. 2023. "Public Values? A Systematic Literature Review into the Outcomes of Public Service Co-Creation." *Public Management Review* 1–33. https://doi.org/10.1080/14719037.2023.2288248

Agerström, J., R. Carlsson, L. Nicklasson, and L. Guntell. 2016. "Using Descriptive Social Norms to Increase Charitable Giving: The Power of Local Norms." *Journal of Economic Psychology* 52:147–153. https://doi.org/10.1016/j.joep.2015.12.007

Ahmad, Z., and P. Esposito. 2024. "EU Recovery Plans and Digitalization in Public Value Creation: An Exploratory Research in European Countries." *Qlantic Journal of Social Sciences* 5 (3): 270–279. https://doi.org/10.55737/qjss.579187562

Ahmad, Z., and P. Esposito. 2025. "Collaborative Governance for Social Change and Environmental Sustainability: A Case Study of Campania Region." *Administrative Sciences* 15 (6): 217. https://doi.org/10.3390/admsci15060217

Ahmad, Z., P. Esposito, and M. Ali. 2025. "Unpacking Public Value Destruction Through Solid Waste Management: A Case Study of Pakistan." *Qlantic Journal of Social Sciences and Humanities* 6 (1): 145–162. https://doi.org/10.55737/qjssh.vi-i.25309

Alford, J. 2009. *Engaging Public Sector Clients: From Service-Delivery to Co-Production*. Springer.

Alford, J. 2014. "The Multiple Facets of Co-Production: Building on the Work of Elinor Ostrom." *Public Management Review* 16 (3): 299–316. https://doi.org/10.1080/14719037.2013.806578

Alford, J., and J. O'Flynn. 2012. *Rethinking Public Service Delivery: Managing with External Providers*. Bloomsbury Publishing.

Allcott, H. 2011. "Social Norms and Energy Conservation." *Journal of Public Economics* 95 (9–10): 1082–1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Alm, J., B. R. Jackson, and M. McKee. 2009. "Getting the Word Out: Enforcement Information Dissemination and Compliance Behavior." *Journal of Public Economics* 93 (3–4): 392–402. https://doi.org/10.1016/j.jpubeco.2008.10.007

Andreoni, J., B. Erard, and J. Feinstein. 1998. "Tax Compliance." *Journal of Economic Literature* 36 (2): 818–860.

Arnstein, S. R. 1969. "A Ladder of Citizen Participation." *Journal of the American Institute of Planners* 35 (4): 216–224. https://doi.org/10.1080/01944366908977225

Barbera, C., T. Nabatchi, A. Sancino, and M. Sicilia. 2025. "Monetary and Symbolic Rewards: Do They Matter for Fostering Co-Commissioning and Co-Delivery of Public Services?" *Public Management Review* 27 (1): 1–28. https://doi.org/10.1080/14719037.2023.2219265

Becker, G. S. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76 (2): 169–217. https://doi.org/10.1086/259394

Benington, J., and M. Moore. 2010. *Public Value: Theory and Practice*. Bloomsbury Publishing.

Biel, A., and J. Thøgersen. 2007. "Activation of Social Norms in Social Dilemmas: A Review of the Evidence and Reflections on the Implications for Environmental Behaviour." *Journal of Economic Psychology* 28 (1): 93–112. https://doi.org/10.1016/j.joep.2006.03.003

Bonan, J., C. Cattaneo, G. d'Adda, and M. Tavoni. 2020. "The Interaction of Descriptive and Injunctive Social Norms in Promoting Energy Conservation." *Nature Energy* 5 (11): 900–909. https://doi.org/10.1038/s41560-020-00719-z

Bovaird, T. 2007. "Beyond Engagement and Participation: User and Community Coproduction of Public Services." *Public Administration Review* 67 (5): 846–860. https://doi.org/10.1111/j.1540-6210.2007.00773.x

Bovaird, T., and E. Loeffler. 2012. "From Engagement to Co-Production: The Contribution of Users and Communities to Outcomes and Public Value." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 23 (4): 1119–1138. https://doi.org/10.1007/s11266-012-9309-6

Bovaird, T., G. Stoker, T. Jones, E. Loeffler, and M. Pinilla Roncancio. 2016. "Activating Collective Co-Production of Public Services: Influencing Citizens to Participate in Complex Governance Mechanisms in the UK." *International Review of Administrative Sciences* 82 (1): 47–68. https://doi.org/10.1177/0020852314566009

Brandsen, T., and M. Honingh. 2016. "Distinguishing Different Types of Coproduction: A Conceptual Analysis Based on the Classical Definitions." *Public Administration Review* 76 (3): 427–435. https://doi.org/10.1111/puar.12465

Brandsen, T., T. Steen, and B. Verschuere. 2018. *Co-Production and Co-Creation: Engaging Citizens in Public Services*. 1st ed. Routledge. https://doi.org/10.4324/9781315204956

Brix, J., H. K. Krogstrup, and N. M. Mortensen. 2020. "Evaluating the Outcomes of Co-Production in Local Government." *Local Government Studies* 46 (2): 169–185. https://doi.org/10.1080/03003930.2019.1702530

Brudney, J. L., and R. E. England. 1983. "Toward a Definition of the Coproduction Concept." *Public Administration Review* 43 (1): 59–65. https://doi.org/10.2307/975300

Buckley, P. J., J. Clegg, and H. Tan. 2006. "Cultural Awareness in Knowledge Transfer to China—The Role of Guanxi and Mianzi." *Journal of World Business* 41 (3): 275–288. https://doi.org/10.1016/j.jwb.2006.01.008

Carminati, M., D. Cavenago, and L. Mariani. 2022. "Co-Production Before, During, and After the First COVID-19 Lockdown: The Case of Developmental Services for Youth with Disabilities." *International Review of Administrative Sciences* 89 (3): 864–882. https://doi.org/10.1177/00208523221134484

Cheng, Y., J. Yu, Y. Shen, and B. Huang. 2020. "Coproducing Responses to COVID-19 with Community-Based Organizations: Lessons from Zhejiang Province, China." *Public Administration Review* 80 (5): 866–873. https://doi.org/10.1111/puar.13244

Christensen, R. K., R. Nesbit, and J. M. Stritch. 2018. "The Role of Employees' Public Service Motives and Organizational Commitment in Workplace Giving Campaigns." *The American Review of Public Administration* 48 (7): 644–658. https://doi.org/10.1177/0275074017701223

Cialdini, R. B., R. R. Reno, and C. A. Kallgren. 1990. "A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places." *Journal of Personality and Social Psychology* 58 (6): 1015–1026. https://doi.org/10.1037/0022-3514.58.6.1015

Cole, D. H., G. Epstein, and M. D. McGinnis. 2019. "The Utility of Combining the IAD and SES Frameworks." *International Journal of the Commons* 13 (1): 244. https://doi.org/10.18352/ijc.864

Corman, H., and H. N. Mocan. 2000. "A Time-Series Analysis of Crime, Deterrence, and Drug Abuse in New York City." *American Economic Review* 90 (3): 584–604. https://doi.org/10.1257/aer.90.3.584

Crawford, S. E. S., and E. Ostrom. 1995. "A Grammar of Institutions." *American Political Science Review* 89 (3): 582–600. https://doi.org/10.2307/2082975

Dudau, A., R. Glennon, and B. Verschuere. 2019. "Following the Yellow Brick Road? (Dis)Enchantment with Co-Design, Co-Production and Value Co-Creation in Public Services." *Public Management Review* 21 (11): 1577–1594. https://doi.org/10.1080/14719037.2019.1653604

Dvir, R. 2024. "Nudging Citizens Co-Production: Assessing Multiple Behavioral Strategies." *Policy Sciences* 57 (4): 719–743. https://doi.org/10.1007/s11077-024-09546-5

Ehrlich, I. 1973. "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation." *Journal of Political Economy* 81 (3): 521–565. https://doi.org/10.1086/260058

Eliadis, P., M. M. Hill, and M. Howlett. 2005. *Designing Government: From Instruments to Governance*. McGill-Queen's Press - MQUP.

Everett, J. A., C. Colombatto, V. Chituc, W. J. Brady, and M. Crockett. 2020. *The Effectiveness of Moral Messages on Public Health Behavioral Intentions During the COVID-19 Pandemic*. OSF. https://doi.org/10.31234/osf.io/9yqs8

Evers, A., and B. Ewert. 2021. "Understanding Co-Production as a Social Innovation." In *The Palgrave Handbook of Co-Production of Public Services and Outcomes*, edited by E. Loeffler and T. Bovaird, 133–153. Springer International Publishing. https://doi.org/10.1007/978-3-030-53705-0_7

Farrow, K., G. Grolleau, and L. Ibanez. 2017. "Social Norms and Pro-Environmental Behavior: A Review of the Evidence." *Ecological Economics* 140:1–13. https://doi.org/10.1016/j.ecolecon.2017.04.017

Fisher, R. J. 1993. "Social Desirability Bias and the Validity of Indirect Questioning." *Journal of Consumer Research* 20 (2): 303–315. https://doi.org/10.1086/209351

Folz, D. H., and J. M. Hazlett. 1991. "Public Participation and Recycling Performance: Explaining Program Success." *Public Administration Review* 51 (6): 526–532. https://doi.org/10.2307/976603

Fotaki, M. 2011. "Towards Developing New Partnerships in Public Services: Users as Consumers, Citizens And/Or Co-Producers in Health and Social Care in England and Sweden." *Public Administration* 89 (3): 933–955. https://doi.org/10.1111/j.1467-9299.2010.01879.x

Frey, B. S., and B. Torgler. 2007. "Tax Morale and Conditional Cooperation." *Journal of Comparative Economics* 35 (1): 136–159. https://doi.org/10.1016/j.jce.2006.10.006

Han, X., and C. Baird. 2022. "Government Crisis Messaging on Social Media, Citizen Online Engagement and Compliance with Policies." *Public Management Review* 2022 (1): 1–22. https://doi.org/10.1080/14719037.2022.2103843

He, L., Y. Dai, and Y. Guo. 2025. "Aligning Behavioral Assumptions Underlying Policy Instruments: A Principle for Designing Policy Mixes Targeting Behavioral Change." *Public Administration*, *n/a*(n/a). 103 (4): 1178–1201. https://doi.org/10.1111/padm.13057

Huth, P., and B. Russett. 1990. "Testing Deterrence Theory: Rigor Makes a Difference." *World Politics* 42 (4): 466–501. https://doi.org/10.2307/2010511

Im, T., W. Cho, G. Porumbescu, and J. Park. 2014. "Internet, Trust in Government, and Citizen Compliance." *Journal of Public Administration Research and Theory* 24 (3): 741–763. https://doi.org/10.1093/jopart/mus037

Jakobsen, M. 2013. "Can Government Initiatives Increase Citizen Coproduction? Results of a Randomized Field Experiment." *Journal of Public Administration Research and Theory* 23 (1): 27–54. https://doi.org/10.1093/jopart/mus036

Jaspers, S., and T. Steen. 2021. "Does Co-Production Lead to the Creation of Public Value? Balancing the Dimensions of Public Value Creation in Urban Mobility Planning." *Administration & Society* 53 (4): 619–646. https://doi.org/10.1177/0095399720957613

Jiang, M., and B. Fan. 2024. "Citizens' Conscious Engagement in Digital Platforms: Advancing Public Service Delivery Within the Public Service Logic Framework." *Public Management Review* 1–19. https://doi.org/10.1080/14719037.2024.2355321

Kang, S., and G. G. Van Ryzin. 2019. "Coproduction and Trust in Government: Evidence from Survey Experiments." *Public Management Review* 21 (11): 1646–1664. https://doi.org/10.1080/14719037.2019.1619812

Kiser, L. L. 1984. "Toward an Institutional Theory of Citizen Coproduction." *Urban Affairs Quarterly* 19 (4): 485–510. https://doi.org/10.1177/004208168401900406

Kuang, Y., and B. Lin. 2021. "Public Participation and City Sustainability: Evidence from Urban Garbage Classification in China." *Sustainable Cities and Society* 67:102741. https://doi.org/10.1016/j.scs.2021.102741

Lascoumes, P., and P. Le Gales. 2007. "Introduction: Understanding Public Policy Through Its Instruments—From the Nature of Instruments to the Sociology of Public Policy Instrumentation." *Governance* 20 (1): 1–21. https://doi.org/10.1111/j.1468-0491.2007.00342.x

Lee, S., and C. Na. 2024. "Why Citizens Engage in Co-Production: A Theoretical Framework and Experimental Evidence." *Public Performance & Management Review* 47 (2): 419–448. https://doi.org/10.1080/15309576.2023.2288054

Li, B., B. Hu, T. Liu, and L. Fang. 2019. "Can Co-Production Be State-Led? Policy Pilots in Four Chinese Cities." *Environment and Urbanization* 31 (1): 249–266. https://doi.org/10.1177/0956247818797276

Li, H., and E. Y. Lu. 2024. "Which Matters More in Coproduction? Political Message, Policy, or Factual Information." *The American Review of Public Administration* 54 (4): 354–376. https://doi.org/10.1177/02750740231213949

Liu, B., S. Lin, S. He, and J. Zhang. 2023. "Encourage or Impede? The Relationship Between Trust in Government and Coproduction." *Public Management Review* 1–28. https://doi.org/10.1080/14719037.2023.2220002

Liu, N. N., C. W.-H. Lo, X. Zhan, and W. Wang. 2015. "Campaign-Style Enforcement and Regulatory Compliance." *Public Administration Review* 75 (1): 85–95. https://doi.org/10.1111/puar.12285

Loeffler, E., and T. Bovaird. 2018. "From Participation to Co-Production: Widening and Deepening the Contributions of Citizens to Public Services and Outcomes." In *The Palgrave Handbook of Public Administration and Management in Europe*, edited by E. Ongaro and S. Van Thiel, 403–423. Palgrave Macmillan UK. https://doi.org/10.1057/978-1-137-55269-3_21

Loeffler, E., and T. Bovaird. 2021. "User and Community Co-Production of Public Services and Outcomes—A Map of the Current State of Play." In *The Palgrave Handbook of Co-Production of Public Services and Outcomes*, edited by E. Loeffler and T. Bovaird, 3–30. Springer International Publishing. https://doi.org/10.1007/978-3-030-53705-0_1

Lott, John R., Jr., and D. B. Mustard. 1997. "Crime, Deterrence, and Right-to-Carry Concealed Handguns." *The Journal of Legal Studies* 26 (1): 1–68. https://doi.org/10.1086/467988

McMullin, C. 2025. ""We're Not There to Lead": Professional Roles and Responsibilities in "Citizen-Led" Co-Production." *Public Administration Review* 85 (1): 165–175. https://doi.org/10.1111/puar.13770

Mill, J. S. 1998. *On Liberty and Other Essays*. Oxford University Press.

Moynihan, D., P. Herd, and H. Harvey. 2015. "Administrative Burden: Learning, Psychological, and Compliance Costs in Citizen-State Interactions." *Journal of Public Administration Research and Theory* 25 (1): 43–69. https://doi.org/10.1093/jopart/muu009

Nabatchi, T. 2018. "Public Values Frames in Administration and Governance." *Perspectives on Public Management and Governance* 1 (1): 59–72. https://doi.org/10.1093/ppmgov/gvx009

Nabatchi, T., A. Sancino, and M. Sicilia. 2017. "Varieties of Participation in Public Services: The Who, When, and What of Coproduction." *Public Administration Review* 77 (5): 766–776. https://doi.org/10.1111/puar.12765

Nederhof, A. J. 1985. "Methods of Coping with Social Desirability Bias: A Review." *European Journal of Social Psychology* 15 (3): 263–280. https://doi.org/10.1002/ejsp.2420150303

Neville, F. G., A. Templeton, J. R. Smith, and W. R. Louis. 2021. "Social Norms, Social Identities and the COVID-19 Pandemic: Theory and Recommendations." *Social and Personality Psychology Compass* 15 (5): e12596. https://doi.org/10.1111/spc3.12596

Olsaretti, S. 1998. "Freedom, Force and Choice: Against the Rights-Based Definition of Voluntariness." *Journal of Political Philosophy* 6 (1): 53–78. https://doi.org/10.1111/1467-9760.00046

Osborne, S. P. 2018. "From Public Service-Dominant Logic to Public Service Logic: Are Public Service Organizations Capable of Co-Production and Value Co-Creation?" *Public Management Review* 20 (2): 225–231. https://doi.org/10.1080/14719037.2017.1350461

Osborne, S. P., M. Powell, T. Cui, and K. Strokosch. 2022. "Value Creation in the Public Service Ecosystem: An Integrative Framework." *Public Administration Review* 82 (4): 634–645. https://doi.org/10.1111/puar.13474

Osborne, S. P., Z. Radnor, and K. Strokosch. 2016. "Co-Production and the Co-Creation of Value in Public Services: A Suitable Case for Treatment?" *Public Management Review* 18 (5): 639–653. https://doi.org/10.1080/14719037.2015.1111927

Osborne, S. P., and K. Strokosch. 2013. "It Takes Two to Tango? Understanding the Co-Production of Public Services by Integrating the Services Management and Public Administration Perspectives." *British Journal of Management* 24 (S1): S31–S47. https://doi.org/10.1111/1467-8551.12010

Osborne, S. P., K. Strokosch, and Z. Radnor. 2018. "Co-Production and the Co-Creation of Value in Public Services: A Perspective from Service Management." In *Co-Production and Co-Creation: Engaging Citizens in Public Services*, edited by Taco Brandsen, Trui Steen, and Bram Verschuere, 18–26. New York: Routledge.

Ostrom, E. 1996. "Crossing the Great Divide: Coproduction, Synergy, and Development." *World Development* 24 (6): 1073–1087. https://doi.org/10.1016/0305-750X(96)00023-X

Ostrom, E. 2000. "Collective Action and the Evolution of Social Norms." *Journal of Economic Perspectives* 14 (3): 137–158. https://doi.org/10.1257/jep.14.3.137

Ostrom, E. 2009. *Understanding Institutional Diversity*. Princeton University Press.

Ostrom, E. 2011. "Background on the Institutional Analysis and Development Framework." *Policy Studies Journal* 39 (1): 7–27. https://doi.org/10.1111/j.1541-0072.2010.00394.x

Ostrom, E., R. Gardner, and J. Walker. 1994. *Rules, Games, and Common-Pool Resources*. University of Michigan Press.

Parks, R. B., P. C. Baker, L. Kiser, R. Oakerson, E. Ostrom, V. Ostrom, S. L. Percy, M. B. Vandivort, G. P. Whitaker, and R. Wilson. 1981. "Consumers as Coproducers of Public Services: Some Economic and Institutional Considerations." *Policy Studies Journal* 9 (7): 1001–1011. https://doi.org/10.1111/j.1541-0072.1981.tb01208.x

Percy, S. L. 1978. "Conceptualizing and Measuring Citizen Co-Production of Community Safety." *Policy Studies Journal* 7 (s1): 486–493. https://doi.org/10.1111/j.1541-0072.1978.tb01797.x

Pestoff, V. 2006. "Citizens and Co-Production of Welfare Services: Childcare in Eight European Countries." *Public Management Review* 8 (4): 503–519. https://doi.org/10.1080/14719030601022882

Pestoff, V. 2018. "Co-Production at the Crossroads of Public Administration Regimes." In *Co-Production and Co-Creation: Engaging Citizens in Public Services*, edited by Taco Brandsen, Trui Steen, and Bram Verschuere, 27–36. New York: Routledge.

Posner, R. A., and E. B. Rasmusen. 1999. "Creating and Enforcing Norms, with Special Reference to Sanctions." *International Review of Law and Economics* 19 (3): 369–382. https://doi.org/10.1016/S0144-8188(99)00013-7

Qin, X., and C. Owen. 2021. "Social Forces and Street-Level Governance in Shanghai: From Compliance to Participation in Recycling Regulations." *The China Quarterly* 248 (1): 1081–1102. https://doi.org/10.1017/S0305741021000114

Rich, R. C. 1981. "Interaction of the Voluntary and Governmental Sectors: Toward an Understanding of the Coproduction of Municipal Services." *Administration & Society* 13 (1): 59–76. https://doi.org/10.1177/009539978101300104

Rogge, K. S., and K. Reichardt. 2016. "Policy Mixes for Sustainability Transitions: An Extended Concept and Framework for Analysis." *Research Policy* 45 (8): 1620–1635. https://doi.org/10.1016/j.respol.2016.04.004

Rosentraub, M. S., and K. S. Harlow. 1983. "Public/Private Relations and Service Delivery: The Coproduction of Personal Safety." *Policy Studies Journal* 11 (3): 445–457. https://doi.org/10.1111/j.1541-0072.1983.tb00663.x

Schultz, P. W., J. M. Nolan, R. B. Cialdini, N. J. Goldstein, and V. Griskevicius. 2007. "The Constructive, Destructive, and Reconstructive Power of Social Norms." *Psychological Science* 18 (5): 429–434. https://doi.org/10.1111/j.1467-9280.2007.01917.x

Sharp, E. B. 1980. "Toward a New Understanding of Urban Services and Citizen Participation: The Coproduction Concept." *Midwest Review of Public Administration* 14 (2): 105–118. https://doi.org/10.1177/027507408001400203

Sicilia, M., E. Guarini, A. Sancino, M. Andreani, and R. Ruffini. 2016. "Public Services Management and Co-Production in Multi-Level Governance Settings." *International Review of Administrative Sciences* 82 (1): 8–27. https://doi.org/10.1177/0020852314566008

Siddiki, S. 2011. "Rules and Decision Making: Understanding the Factors That Shape Regulatory Compliance." [Ph.D., University of Colorado at Denver]. https://www.proquest.com/docview/916426272/abstract/B4182DC4039D4170PQ/1.

Siddiki, S., X. Basurto, and C. M. Weible. 2012. "Using the Institutional Grammar Tool to Understand Regulatory Compliance: The Case of Colorado Aquaculture." *Regulation & Governance* 6 (2): 167–188. https://doi.org/10.1111/j.1748-5991.2012.01132.x

Souza, V. B., and L. M. Neto. 2018. "A Typology of Coproduction: Emphasizing Shared Power." In *From Austerity to Abundance? Creative Approaches to Coordinating the Common Good*, edited by Margaret Stout, 117–139. Emerald Publishing Limited. https://doi.org/10.1108/s2045-794420180000006006

Sunstein, C. R., and R. H. Thaler. 2003. "Libertarian Paternalism Is Not an Oxymoron." *The University of Chicago Law Review* 70 (4): 1159–1202. https://doi.org/10.2307/1600573

Thomsen, M. K., M. Baekgaard, and U. T. Jensen. 2020. "The Psychological Costs of Citizen Coproduction." *Journal of Public Administration Research and Theory* 30 (4): 656–673. https://doi.org/10.1093/jopart/muaa001

Tõnurist, P., and L. Surva. 2016. "Is Volunteering Always Voluntary? Between Compulsion and Coercion in Co-Production." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 28 (1): 223–247. https://doi.org/10.1007/s11266-016-9734-z

Trætteberg, H. S., and B. Enjolras. 2024. "Institutional Determinants of Co-Production: Norway as an Illustrative Case." *Nonprofit and Voluntary Sector Quarterly* 53 (2): 536–559. https://doi.org/10.1177/08997640231176801

Treger, C. 2023. "When Do People Accept Government Paternalism? Theory and Experimental Evidence." *Regulation & Governance* 17 (1): 195–214. https://doi.org/10.1111/rego.12443

Tu, X. 2021. "Understanding the Role of Nonprofit Organizations in the Provision of Social Services in China: An Exploratory Study." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 32 (4): 767–779. https://doi.org/10.1007/s11266-021-00375-1

Van Eijk, C., and T. Steen. 2016. "Why Engage in Co-Production of Public Services? Mixing Theory and Empirical Evidence." *International Review of Administrative Sciences* 82 (1): 28–46. https://doi.org/10.1177/0020852314566007

Vedung, E. 1998. "Policy Instruments: Typologies and Theories." In *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, edited by Bemelmans-Videc Marie-Louise, C. Rist Ray, and Vedung Evert, 21–58. Routledge.

Verschuere, B., T. Brandsen, and V. Pestoff. 2012. "Co-Production: The State of the Art in Research and the Future Agenda." *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 23 (4): 1083–1101. https://doi.org/10.1007/s11266-012-9307-8

Villamayor-Tomas, S., P. Grundmann, G. Epstein, T. Evans, and C. Kimmich. 2015. "The Water-Energy-Food Security Nexus Through the Lenses of the Value Chain and the Institutional Analysis and Development Frameworks." *Water Alternatives* 8 (1): 735–755.

Voorberg, W. H., V. J. J. M. Bekkers, and L. G. Tummers. 2015. "A Systematic Review of Co-Creation and Co-Production: Embarking on the Social Innovation Journey." *Public Management Review* 17 (9): 1333–1357. https://doi.org/10.1080/14719037.2014.930505

Voorberg, W., S. Jilke, L. Tummers, and V. Bekkers. 2018. "Financial Rewards Do Not Stimulate Coproduction: Evidence from Two Experiments." *Public Administration Review* 78 (6): 864–873. https://doi.org/10.1111/puar.12896

Wang, G., Z. Zhang, S. Xie, and Y. Guo. 2025. "Province of Origin, Decision-Making Bias, and Responses to Bureaucratic Versus Algorithmic Decision-Making." *Public Administration Review*, *n/a*(n/a). 85 (6): 1738–1756. https://doi.org/10.1111/puar.13928

Wang, Y., S. Zhang, and J. Zhang. 2025. "The Impact of Descriptive Social Norms on Coproduction: How Communication Frames Matter." *Public Management Review* 1–27. https://doi.org/10.1080/14719037.2025.2454502

Weng, S., and Y. Zhang. 2020. "Coproduction of Community Public Service: Evidence from China's Community Foundations." *Journal of Chinese Governance* 5 (1): 90–109. https://doi.org/10.1080/23812346.2019.1710048

Whitaker, G. P. 1980. "Coproduction: Citizen Participation in Service Delivery." *Public Administration Review* 40 (3): 240–246. https://doi.org/10.2307/975377

Williamson, H., K. Murphy, E. Sargeant, and M. McCarthy. 2022. "The Role of Bounded-Authority Concerns in Shaping Citizens' Duty to Obey Authorities

During COVID-19." *Policing: An International Journal* 45 (2): 169–185. https://doi.org/10.1108/PIJPSM-03-2022-0036

Wu, J., and J. Xiong. 2022. "How Governance Tools Facilitate Citizen Co-Production Behavior in Urban Community Micro-Regeneration: Evidence from Shanghai." *Land* 11 (8), Article 8. 1243. https://doi.org/10.3390/land11081243

Wu, Y., H. Xiao, and F. Yang. 2022. "Government Information Dsiclosure and Citizen Coproduction During COVID-19 in China." *Governance* 35 (4): 1005–1027. https://doi.org/10.1111/gove.12645

Young, O. R. 2013. *Compliance & Public Authority: A Theory with International Applications*. RFF Press. https://doi.org/10.4324/9781315064475

Zhao, T., and Z. Wu. 2020. "Citizen–State Collaboration in Combating COVID-19 in China: Experiences and Lessons from the Perspective of Co-Production." *The American Review of Public Administration* 50 (6–7): 777–783. https://doi.org/10.1177/0275074020942455

Zhao, T., J. Yuan, Z. Wu, and D. Xu. 2024. "Resolving the Unintended Consequences of Collective Co-Production Through Group Co-Production: A Case Study in Shanghai." *Humanities and Social Sciences Communications* 11 (1): 1505. https://doi.org/10.1057/s41599-024-04063-5

Appendix

Table A1. Operationalization of variables.

	Study 1[1]	Study 2[2]
Dependent variables		
Passive co-production	During the peak of the pandemic, I still engaged in face-to-face social activities with friends or relatives who did not live with me.	If you were a resident of this community, what is your willingness to participate in garbage classification this month?
	During the peak of the pandemic, I went out for walks, runs, bike rides, or to other places to relax for a while.	If you were a resident of this community, what do you think the willingness of other residents to participate in garbage classification this month is?
	During the peak of the pandemic, I drove to engage in leisure activities, such as sports.	
Independent variables		
Deterrence	During the pandemic, the frequency at which I saw police patrols in our community was the same as before the pandemic[3].	**None** **Low**: Community staff will monitor garbage classification at disposal points **every Monday**. Residents who refuse to make corrections after repeated warnings will face a **50** CNY fine. **High**: Community staff will monitor garbage classification at disposal points **daily**. Residents who refuse to make corrections after repeated warnings will face a **100** CNY fine.
Social norms	In general, residents in my community are willing to obey the law.	**None**: Your household recycled **7.5** KG.
	Residents in my community are willing to comply with the COVID-19 prevention laws and regulations	**Low**: Your household recycled **7.5** KG. The community average is **7.5** KG. Top households recycled **12.5** KG. Your household is **40%** behind the top households.
	The majority of people in our community can comply with the regulations imposed by the local government in response to the pandemic.	**High**: Your household recycled **2.5** KG. The community average is **7.5** KG. Top households recycled **12.5** KG. Your household is **80%** behind the top households.
	The majority of my friends can comply with the regulations imposed by the local government in response to the pandemic	

1. In Study 1, Likert 5-Point Scale was used for all variables from very disagree to very agree; Passive co-production was reverse coded.
2. In Study 2, Likert 7-Point Scale was used for dependent variables from very willing to very unwilling.
3. Variable reverse coded. Based on the assumption that the frequency of police presence was generally higher during the COVID-19 than under routine scenario, 'same' frequency (very agree) was treated as low deterrence.

Table A2. Experimental manipulation and sample size.

		Deterrence		
		None	Low	High
Social Norms	None	Group 1 ($N = 179$)	Group 4 ($N = 180$)	Group 7 ($N = 180$)
	Low	Group 2 ($N = 180$)	Group 5 ($N = 180$)	Group 8 ($N = 180$)
	High	Group 3 ($N = 179$)	Group 6 ($N = 180$)	Group 9 ($N = 180$)

Table A3. Balance test.

	Group1	Group2	Group3	Group4	Group5	Group6	Group7	Group8	Group9	F/df	P value
Age	2.90	2.89	2.95	3.01	2.88	3.02	2.92	2.83	2.99	0.55/4	0.70
Gender	1.50	1.49	1.51	1.50	1.51	1.51	1.49	1.49	1.49	0.05/1	0.82
Education	7.24	7.21	7.28	7.39	7.22	7.28	7.15	7.18	7.19	0.67/6	0.67
Marital status	1.56	1.56	1.59	1.56	1.51	1.60	1.52	1.54	1.56	0.47/2	0.62
Household registration	1.65	1.65	1.62	1.64	1.68	1.67	1.63	1.66	1.65	0.12/1	0.73

Note: *$p < .1$, **$p < .05$, ***$p < .01$.

Table A4. Sample characteristics.

Variable	Value	Study 1	Study 2	China[1]
Age (Mean)		29.70	30.20	38.80
Gender (%)	Male	37.30	49.90	48.76
	Female	62.60	50.10	51.24
	Others	0.10	0.00	0.00
Education (%)	High school and below	14.40	4.00	76.46
	Junior college	10.90	10.20	11.99
	Undergraduate	61.90	70.30	10.34
	Postgraduate	12.80	15.50	1.21
Marital status (%)	Single	45.60	45.20	19.21
	Married	53.80	54.10	80.79
	Others	0.60	0.70	0.00
Household registration (%)	Rural	40.10	35.20	36.11
	Urban	59.20	64.80	63.89
Passive Co-production (Mean)	–	3.98	5.87	–
Passive Co-production of others (Mean)	–	–	5.49	–
N		1000	1618	1.41 billion

Note: 1. Data of 2020 Chinese population comes from the National Bureau of Statistics in China: https://data.stats.gov.cn/easyquery.htm?cn=C01.; https://www.stats.gov.cn/sj/pcsj/rkpc/7rp/indexch.htm.

Table A5. Co-production willingness of others across experimental groups.

		Deterrence			
		None	Low	High	Total
Social Norms	None	5.30	5.34	5.48	5.37
	Low	5.49	5.39	5.54	5.47
	High	5.65	5.79	5.37	5.61
	Total	5.48	5.51	5.46	5.49

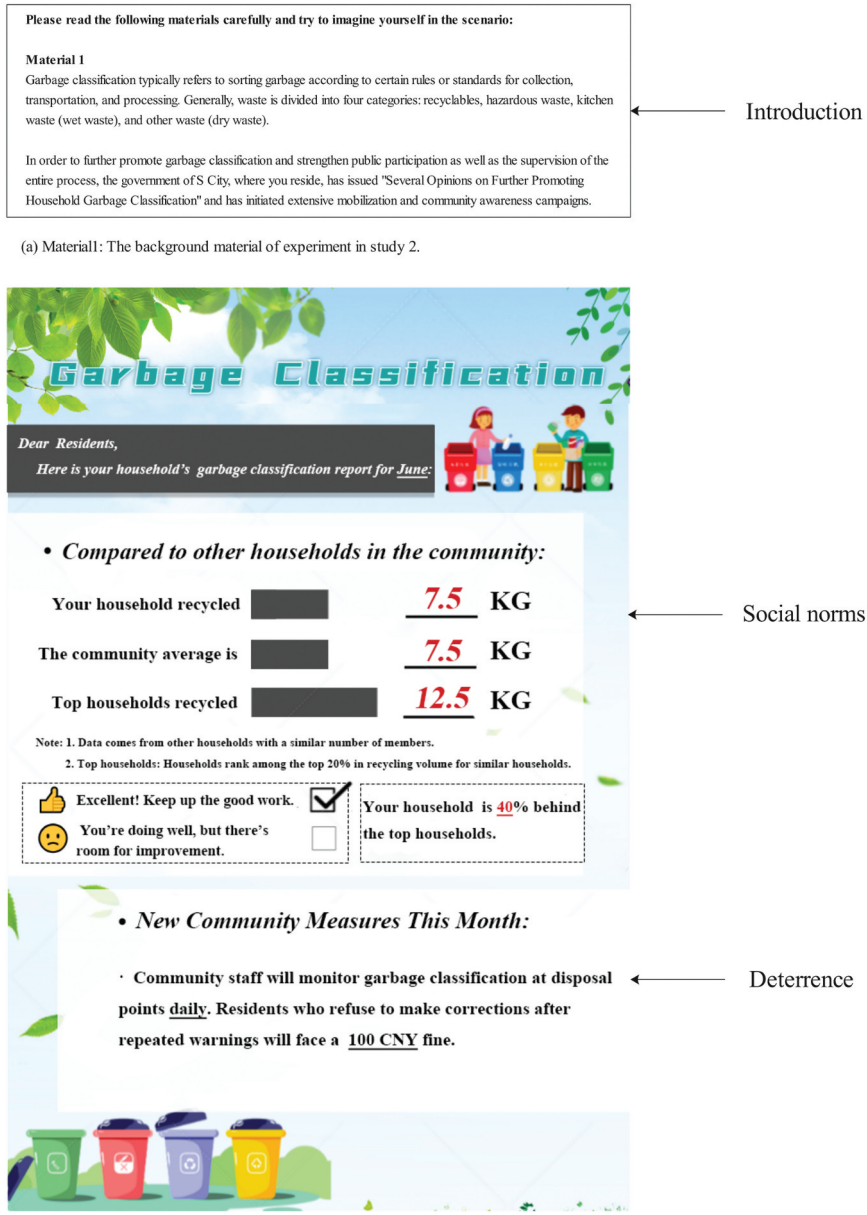

Figure A1. Example materials of experiment in study 2. Material 1 presents the background material introducing the garbage classification policy and contextual setting. Participants were asked to imagine themselves as residents in City S participating in local garbage classification. Material 2 shows the experimental manipulations: social norms were operationalized through the amount of recycled garbage, while government deterrence was manipulated by the frequency of supervision and the severity of penalties.

请您仔细阅读以下材料，并尽量代入该情景：

材料一

垃圾分类，一般是指按一定规定或标准将垃圾分类投放、收集、运输和处理，通常可以分为四类：可回收物、有害垃圾、厨余垃圾（湿垃圾）和其他垃圾（干垃圾）。

为深入推进垃圾分类工作，加强垃圾分类全民参与和全流程监管，您所在的S市政府出台了《关于进一步推进生活垃圾分类工作的若干意见》，并开展广泛的动员和社区宣传。

Introduction

(a) Material1: The background material of experiment in study 2.

Social norms

Deterrence

(b) Material2: Experimental manipulation in study 2.

Figure A2. Original (Chinese) example materials of experiment in study 2. 1斤 = 0.5 KG; 1 CNY ≈0.14 USD.