Trust and Two-way Coproduction: Paired Experiments on Citizens and Policymakers

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Abstract

Does mutual trust influence the willingness of policy stakeholders to collaborate in policy implementation? While the public management literature has extensively discussed the theoretical link between trust and collaboration, the application of this relationship to citizen-government coproduction remains underexplored. To investigate this dynamic, we conducted a paired of survey experiments on U.S. citizens and municipal officials. We presented a scenario featuring a hypothetical city characterized by either high or low public trust in government. Participants from both citizen and official groups were exposed to the same experimental conditions and were asked to report their willingness to coproduce in disaster resilience planning, as well as to estimate the willingness of the other party to coproduce. Findings indicate that public trust increases citizens' willingness to coproduce; however, its effect is not significant among officials. Furthermore, the impact of trust on citizens' willingness to coproduce is mediated by their perceptions of officials' willingness. Bootstrapped analyses suggest that while citizens tend to overestimate the effect of trust on officials' willingness to coproduce, officials are likely to underestimate the willingness of citizens. This study presents a new paradigm to investigating the interdependent relationship between citizens and government in coproduction.

Keywords: coproduction, trust in government, survey experiment

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1 Introduction

The linkage between trust and collaboration is a basic principle in social science (Ostrom 1998). It is also central to the field of collaborative governance, which requires mutual trust between policy actors in the policy implementation process (Ansell and Gash 2008; Emerson et al. 2012; Radin 1996; Thomson and Perry 2006). Collaborative governance is essential for democratic societies. It upholds normative values of inclusion, diversity, and representation in the decision-making process (Bryson et al. 2016) and offers instrumental utility in overseeing commons, which are often too intricate for any single governmental entity to manage effectively (Agranoff and McGuire 2001; Ostrom 1990). Given this, mutual trust between policy actors is foundational for starting collaborations and remains pivotal for their continued success and sustainability (Ansell and Gash 2008).

Scholars have examined the trust-collaboration link using network analysis among participating organizations, but they have less explored this link in the context of citizen-government coproduction (Liu 2022). By mapping trust within dyadic relationships and analyzing the potential for pairs of organizations to form collaborative partnerships, scholars have repeatedly confirmed the trust-collaboration link across various policy domains (e.g., Henry et al. 2011; Huang 2014; Metz et al. 2019; Scott and Thomas 2015). Unlike the structured interactions in organizational collaborations, the individual choices of citizens to engage in the collaborative governance process are often informal (Moynihan 2003). This makes it challenging for scholars to gather network activity data and systematically examine how trust affects varying degrees of collaborative commitment between citizens and government. In this article, we argue that citizen-government coproduction is a fundamental collaborative relationship in democratic society. Omitting to explore the trust-collaboration link in this context leads to two theoretical gaps in public administration literature.

First, existing coproduction studies often adopt an "one-way" approach: They focus their analysis on either citizens or government, investigating their motivations to collaborate

with the other party in policy implementation and service delivery. For example, scholars have shown that representation, perceived legitimacy, and self-capacity influence willingness of citizens to coproduce with government (e.g., Riccucci et al. 2016; Steen 2021; Xu and Tang 2020). Meanwhile, other researchers have identified that administrative costs, benefits, and input legitimacy shape government's inclination to collaborate with citizens (e.g., Migchelbrink and Van de Walle 2020; Moynihan 2003; Yang and Callahan 2007). These "one-way" studies advance collaboration theory by discovering main determinants of coproduction from both sides. Nonetheless, it is also essential to compare the effects of a theory on different collaboration participants and consider the interdependency between them. This consideration becomes particularly important for the trust-collaboration link since trust is often reciprocal in collaborations (Ostrom 1998). Without understanding the causal mechanisms behind trust and collaboration from both the citizens' and government's perspectives, establishing a sustainable coproduction process becomes challenging (Liu 2022).

Second, social scientists have demonstrated that both citizens and government misperceive each other across various policy contexts (Broockman and Skovron 2018; Kertzer 2022; Pereira 2021). Such misperceptions pose barriers to establishing coproduction, and they often arise from mutual distrust (Yang and Callahan 2007; Yang and Pandey 2011). This issue is especially prevalent in advanced democracies where public trust in government has been declining over the past decade, and public officials have become increasingly cynical about civic engagement (Citrin and Stoker 2018; Macdonald 2020). Specifically, when citizens lack trust in government, they perceive that government would not value their opinions in the public decision-making process. Correspondingly, when public officials perceive that citizens do not trust them, they assume a smaller proportion of citizens will participate in the coproduction process. As a result, both parties become less motivated to engage in coproduction. Yet, the validity of this theoretical assumption remains uncertain without a careful investigation.

To address both challenges, we pose two research questions in this article: (1) Does

mutual trust enhance the willingness of both citizens and the government to engage in coproduction with each other? (2) If so, does the perception of the other party's actions elucidate the trust-collaboration link?

We address both questions through a novel paired-experiment approach. Specifically, we carried out two survey-based vignette experiments on nationally representative samples: One targeting municipal officials and the other focusing on the general American public. Both samples received identical manipulation information, presenting a hypothetical city as either trustworthy or untrustworthy from the viewpoint of residents. Following the vignette, we asked respondents to (1) express their willingness to coproduce in disaster resilience planning and (2) estimate the other party's (citizens/government) likelihood of engagement in coproduction. Our regression models and causal mediation analysis advance the trust-collaboration theory and its foundational mechanisms within the realm of coproduction. Additionally, we conducted exploratory analyses comparing misperceptions on coproduction between citizens and officials across trust conditions.

This research offers three key theoretical implications. First, it presents a new paradigm for studying "two-ways" coproduction. This approach not only tests a specific theory (i.e., mutual trust) on the willingness to coproduce from both citizen and government official perspectives but also contrasts the trust effects between these groups. Second, our findings identify the perception of the other party's willingness to coproduce as a mediator in the trust-collaboration link. This mechanism further underscores the interdependent nature of mutual trust in coproduction. Finally, we explore the misperceptions between citizens and government, providing insights for the future direction of coproduction research.

2 Theoretical Rationale

2.1 Collaborative Governance and Coproduction

Collaborative governance broadly refers to a set of institutional processes that integrates governmental and non-governmental actors across sectoral, hierarchical, and jurisdictional

boundaries, enabling them to work together and carry out public services and provide goods (Ansell and Gash 2008). Academics and practitioners advocate collaborative governance through two arguments: normative and instrumental (Bryson et al. 2015). In the normative argument, collaborative governance promotes diversity in the decision-making process by giving voice to a wider array of public and private interests (Fung 2015; Hong and Page 2004), resulting in inclusive communication among actors, mutual trust, and norms of reciprocity. The mutual trust further facilitates collaborative leadership, shared understanding, and commitment to the process of service delivery (Agranoff 2007; Ansell and Gash 2008; Thomson and Perry 2006). On the other hand, the instrumental argument suggests that collaborative governance is an effective tool to address complex policy and management problems across jurisdictional and sectoral boundaries. As Ostrom (1990, 38) argued, when organizations act independently to manage common pool resources, "...the net benefits they obtain usually will be less than could have been achieved if they had coordinated their strategies in some way."

Citizens play a crucial role in collaborative governance. The collaborative action that incorporates citizens' visions and voices represents a unique form of collaborative governance, known as "coproduction" (Bovaird 2007). In this article, we define "coproduction" as "an umbrella concept encompassing a wide range of activities that can occur during any phase of the public service cycle, where state actors and lay actors collaborate to produce benefits" (Nabatchi et al. 2017, 769). Specifically, while public agencies act as the "regular producers" of public goods and services, citizens serve as "coproducers", offering their outsider knowledge to these processes.

Existing research on coproduction primarily explores the drivers that motivate citizens to engage in coproduction. Steen (2021) classifies these drivers into three categories: individual motivations, capability, and institutional support. In individual motivations, factors include material incentives driven by self-interest (Letki and Steen 2021), altruistic purposes based on community interests (Van Eijk and Steen 2016, 2014), issue salience (Pestoff

2012), and dissatisfaction with services (Vanleene et al. 2017). In capability, citizens' socio-demographic backgrounds influence their ability to coproduce. For instance, individuals with lower socio-economic status often face greater barriers to coproduction compared to those with more resources and time (e.g., Clark et al. 2013; Thijssen and Van Dooren 2016). Furthermore, institutional support from government facilitates and encourages citizen participation (e.g., Thomas 2013; Xu and Tang 2020).

Another strand of literature addresses public officials' attitudes towards citizen participation in policy implementation and service delivery (Yang and Callahan 2007; Yang and Pandey 2011). Researchers have identified three key factors influencing these officials' willingness to collaborate with citizens: administrative costs (Irvin and Stansbury 2004; Liao and Schachter 2018; Moynihan 2003), the participatory competencies of citizens (Hong 2015; Yang and Callahan 2007; Yang and Pandey 2011), and the democratic legitimacy of the participatory processes (Migchelbrink and Van de Walle 2020; Pina and Torres 2016; Yang 2005; Yang and Pandey 2011).

2.2 The Trust-Collaboration Link

Although public management scholars study willingness to coproduce in both citizens and public officials' perspectives, research on trust-collaboration link in this area is limited. In this section, we discuss the development of trust-collaboration link in the collaborative network literature and provide a new model to understand trust-collaboration link in citizen-government coproduction.

Mutual trust, often defined as social capital, stems from reciprocity in cooperative partnerships (Coleman 1994; Putnam et al. 1993). The link between trust and collaboration evolves in three stages. First, organizations A and B engage in successful collaborations, bringing benefits to both. Next, each organization expects the other to maintain a mutual benefit principle in future collaborations, reducing the risk of betrayal. With this foundation of trust, they then embark on new collaborative projects. In such relationships, the

mutual trust between A and B is rooted in their reciprocal interactions, fostering positive expectations for future collaborations. This theory is prevalent in collaborative network literature across various policy domains, including regional planning networks (Henry et al. 2011), human service networks (Huang 2014), nonprofit networks (Lambright et al. 2010), and environmental policy networks (Metz et al. 2019).

2.2.1 The Model of Trust-Estimation-Coproduction

The relationship between trust and collaboration in citizen-government coproductions differ from inter-organizational collaborations. As previously mentioned, individual citizen engagements are less structured compared to organizations (Moynihan 2003). Often, citizens lack consistent opportunities to engage with the government in collaborative projects. In many coproduction programs, the set of citizen participants changes annually. For instance, local governments update their disaster resilience plans every three years and incorporate citizen input into the design and revision processes. In such cycles, local governments might collaborate with an entirely different group of citizens during each plan update. Consequently, the feedback they receive can vary widely. In such situations, the trust between citizens and government is not established on reciprocal interactions, and we should revise the theoretical model of the trust-collaboration link.

We define trust in government by citizens' positive expectations regarding the government's intentions and actions (Beshi and Kaur 2020; Cheema and Popovski 2010). The factors influencing public trust can generally be categorized into three dimensions: competence, benevolence, and honesty (Mayer et al. 1995). Competence refers to the government's effectiveness and its ability to deliver public goods (Hetherington and Husser 2012). Benevolence, distinct from competence, assesses whether the government's actions are aimed at serving the public interest (Levi and Stoker 2000). Honesty, the final dimension, is indicative of the government's integrity, judged by its commitment to truthfulness (Grimmelikhuijsen et al. 2013). While these dimensions are interconnected, they each distinctly contribute to

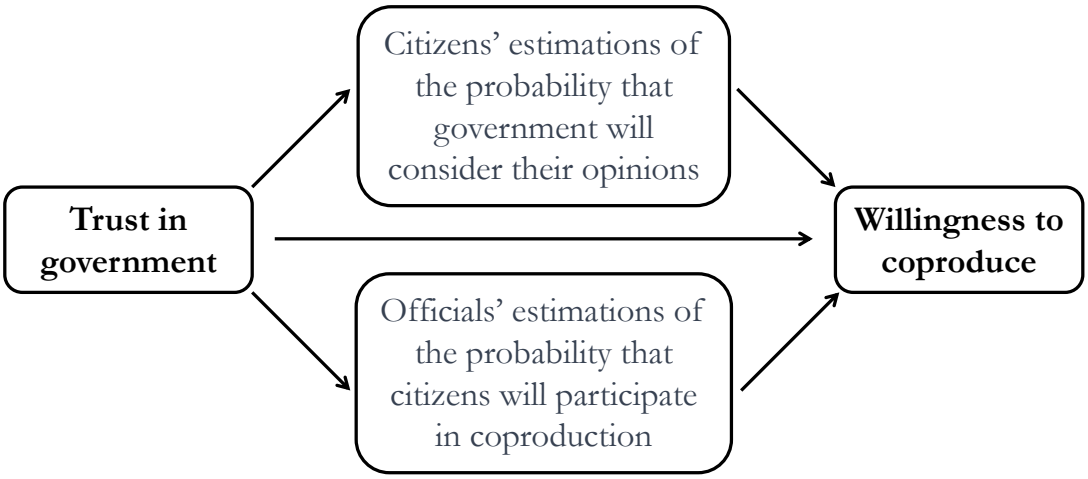
the foundation of public trust.

Rather than relying on reciprocal interactions, citizens often build their trust in government based on information they received, including government performance, transparency levels, development in e-government, and the political leanings of public officials (Farazmand and Carter 2004; Houston and Harding 2013). They source this information from multiple outlets and leverage it to estimate governmental actions. Such estimations, referred to by some scholars as "second-order beliefs," consequently influence citizens' willingness to participate in the coproduction process (Liu 2022).

When public officials are confronted with citizens who either trust or distrust them, their attitudes toward accepting citizen participation in coproduction projects also differ. When public officials recognize that citizens distrust them, they tend to lower their expectations regarding citizen participation. They would estimate that only a small number of citizens will engage in the coproduction process (Yang 2005). Consequently, their enthusiasm for organizing coproduction programs and valuing citizens' opinions in the decision-making process would also diminish (Migchelbrink and Van de Walle 2020; Mosley and Wong 2021; Moynihan 2003).

Figure 1 illustrates the theoretical relationship between trust in government, estimations of each party's actions, and the willingness to coproduce from the perspectives of both citizens and public officials. In summary, trust in government increases the willingness to coproduce for both groups, with this influence being mediated by their respective estimations of each other's actions. Grounded in this rationale, we present three hypotheses that this article aims to test.

Figure 1: Mediation model of Trust-Estimation-Coproduction



H1: Public trust in government will increase officials' and citizens' willingness to coproduce with each other.

H2: Public trust in government will increase officials' and citizens' estimations of each other's willingness to coproduce.

H3: The positive impact of public trust in government on the willingness of officials and citizens to coproduce is mediated by their perceptions of the other party's willingness to coproduce.

3 Empirical Strategy: The Paired Experiment

3.1 Policy Context

Our research examines the link between trust and coproduction within the context of disaster resilience planning. The Federal Emergency Management Agency (FEMA) provides local governments with the Local Mitigation Planning Policy Guide (LMPPG), which serves as a blueprint for crafting their disaster resilience strategies. This guide details the requirements that local governments must satisfy to receive FEMA's approval, enabling them to access financial assistance and resources from FEMA's programs. These programs include the National Flood Insurance Program, Hazard Mitigation Assistance, the Rehabilitation of

High Hazard Potential Dams Program, and the FEMA Building Codes Strategy.

In the "Element A Requirements," the LMPPG poses two questions specifically pertaining to citizen participation: (1) Question A2: "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests, to be involved in the planning process?"; (2) Question A3: "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" Therefore, to obtain FEMA's approval and receive subsidies from the federal government, local governments must exhibit their commitment to engaging citizens in the decision-making process. As of September 30, 2023, a total of over 24,900 local governments and 236 tribal governments have mitigation plans that are approved or approvable-pending-adoption (FEMA 2023).

In this policy framework, the disaster resilience planning has to engage not only cross-sectoral stakeholders in decision-making but also incorporate the visions and voices of local community members. Thus, it offers an appropriate context to examine the relationship between trust and citizen-government coproduction.

3.2 Experimental Design

We conducted a paired of pre-registered survey-based experiments on citizens and municipal officials to test the hypotheses. Both samples were exposed to identical treatment conditions, enabling us not only to evaluate the hypotheses but also to compare their perceptions of each other. In the introduction, we mentioned, "we would like to ask your opinion on citizen participation in disaster resilience planning." We clarified that the questions would be grounded in hypothetical scenarios unrelated to their organization, with no legal obligations. Additionally, we ensured that there was no connection between their responses and their identities. Lastly, we explained that the purpose of our survey was to provide recommendations to local governments facing situations akin to the scenario presented. Research

indicates that asking respondents to state their opinions in an hypothetical scenario can effectively reduce the possibility of social desirability bias (Hughes and Huby 2004; Migchelbrink and Van de Walle 2020).

We informed all respondents that the hypothetical city "Midtown" represents an average-sized American city. Respondents were then randomly assigned into six groups: three subgroups under the "trust in government" condition and three under the "distrust in government" condition. Within both conditions, the three subgroups correspond to the three theoretical facets of trust in government: competence, benevolence, and integrity. Table 1 displays the specific details of each experimental condition.

Table 1: Experimental Conditions

According to a recent poll from a creditable survey company, 80% of Midtown residents indicate that the Midtown municipal government officials are:	
Trust in Government Conditions	**Distrust in Government Conditions**
Trust Factor: Competence	
Group 1: trustworthy because they believe that the Midtown government officials have competence to provide good public services.	**Group 2**: untrustworthy because they believe that the Midtown government officials have no competence to provide good public services.
Trust Factor: Benevolence	
Group 3: trustworthy because they believe that the Midtown government officials exert their best efforts to meet the needs of their citizens.	**Group 4**: untrustworthy because they believe that the Midtown government officials do not exert their best efforts to meet the needs of their citizens.
Trust Factor: Integrity	
Group 5: trustworthy because they believe that the Midtown government officials are honest.	**Group 6**: untrustworthy because they believe that the Midtown government officials are corrupted.

After reviewing the treatment information, we asked respondents to share their opinions on the following situation:

> "Recently, the Midtown government decides to build a collaborative forum to develop a plan for disaster resilience. The forum's targets are to assess the hazards and risks of disaster and climate change, and identify resources, costs, and activities to be implemented in the future. The forum includes different stakeholders including citizens to identify the community's priorities and to gain greater support to build a resilient community."

To quantify the variables of interest, we posed two questions to respondents after they processed the above information. The initial question assessed their willingness to coproduce, while the subsequent one gauged their second-order belief: their estimations of the other party's willingness to coproduce. Table 2 displays the wording employed for the questions directed at both citizens and public officials.

Table 2: Measurements of Dependent Variables

Variable	**Citizen Sample**	**Public Official Sample**
Willingness to Coproduce	If the Midtown government officials ask you to input your voice into the disaster resilience plan, are you willing to participate in this forum?	Please evaluate the following statement as if you were a public official in the Midtown government: "Our disaster resilience plan would depend strongly on the input provided by the Midtown residents in this forum."
Estimation	Please estimate the possibility (%) that Midtown government officials would adopt citizens' suggestions in this forum to finalize their disaster resilience plan?	Please estimate the proportion (%) of Midtown citizens who would be willing to participate in this forum and provide suggestions to the disaster resilience plan.

In both samples, we evaluated the willingness to coproduce utilizing a 6-point Likert scale, ranging from "definitely not" to "definitely yes." To measure estimations, we asked respondents to adjust a sliding bar from 0 to 100, representing their assessed likelihood of the other party's willingness to coproduce. We strategically positioned the estimation question (the mediator between trust and willingness to coproduce) after respondents expressed their

willingness to coproduce. This ordering ensures that the estimation question does not influence respondents to adjust their stated willingness to coproduce (Imai et al. 2011; Kertzer et al. 2023). Following the treatment scenario and questions about the dependent variable, we asked respondents from both samples to provide demographic information.

3.3 Methods of Analysis

We assessed our hypotheses in a two-step process. First, we created a trust variable, assigning a value of 1 to respondents in the "trust in government" condition and a value of 0 to those in the "distrust in government" condition. We then performed regression analyses of the dependent variables—willingness to coproduce and estimation—on the trust variable to evaluate H1 and H2. Second, we applied the nonparametric causal mediation analysis (Imai et al. 2011) to both samples to test H3.

In addition, we also undertook a series of exploratory analyses to measure the extent of misperceptions between citizens and public officials within each experimental condition. To do this, we rescaled the willingness to coproduce, coding it as 1 for responses of "maybe yes," "yes," or "definitely yes," and 0 for all other responses. This recoding helped us create a binary variable reflecting coproduction approval. Then, we used bootstrap methods to generate distributions for the coproduction approval and estimation variables, allowing us to compare the actual proportion of respondents' willing to coproduce with the proportion that was estimated by the other sample. We further predicted the bootstrapped average treatment effects on both the actual and estimated coproduction approvals, aiming to contrast the actual and estimated impacts of trust in government on coproduction among both citizen and public official samples.

3.4 Sampling

Based on the policy context, our study focused on U.S. citizens and municipal government officials. We conducted the citizen survey in May 2023 using the survey platform

Cloud-Research. To ensure the representativeness of our respondents, we matched their income, ethnicity, race, and political affiliation with national estimates from the U.S. Census. Additionally, our citizen survey incorporated two questions designed for manipulation and attention checks. 67% passed the manipulation check, while 79% cleared the attention checks. We included all respondents in our analysis to prevent selection bias (Aronow et al. 2019).

The citizen sample included 1,445 American adults (56% female, 63% White, Mage = 43). Overall, 471 respondents are Democrats, 354 are Republicans, and 619 are independent or other parties. We present the descriptive statistics and the balance test for the citizen sample in Appendix A.1.

The municipal official sample includes mayors, councilors, and city managers. These public officials serve often as decision-makers in policy implementation, so their leadership affects actions in disaster resilience planning. To compile the sample pool of municipal officials, we extracted their names, genders, and email addresses from the official websites of municipalities. The sample pool included officials from American municipalities with populations over 10,000 (2,692 municipalities in total). Municipalities without the public officials' email addresses were removed from the study. We used Qualtrics to create the survey and sent it to municipal officials via email. We issued an initial invitation followed by three reminders in July 2023. Appendix B reports the email invitation.

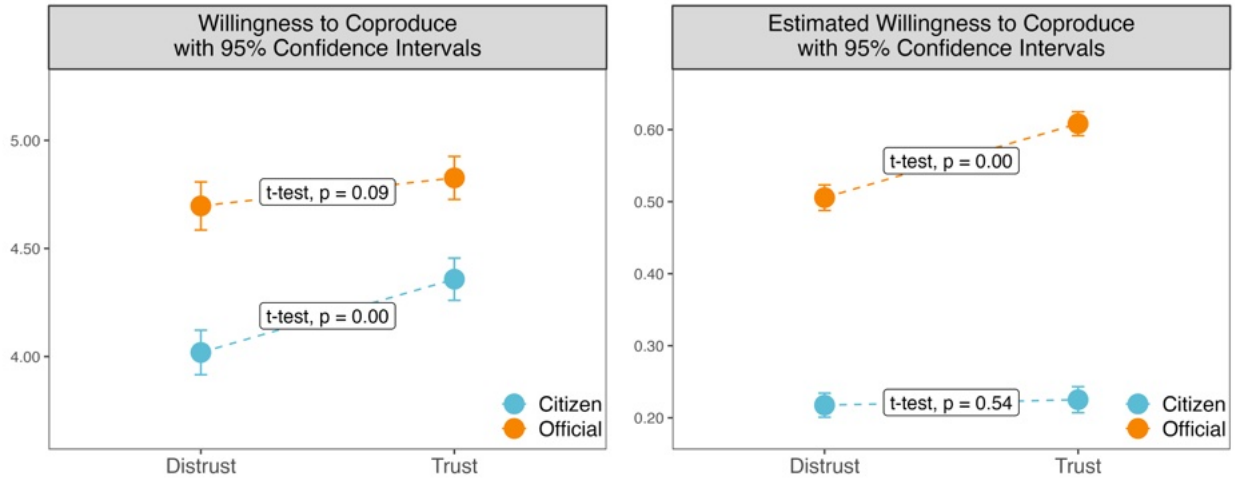
We successfully sent survey invitations to 18,528 municipal officials. The final sample of public officials included 981 individual respondents (35% female, 78% White, Mage = 57), including 823 elected officials and 158 city managers. Overall, 409 respondents are Democrats, 230 are Republicans, and 264 are independent or other parties. We present the descriptive statistics and the balance test for the public official sample in Appendix A.2.

4 Results

4.1 H1 and H2: Testing the Direct Effect of Trust on Coproduction and Estimation

Figure 2 presents the point estimates for the willingness to coproduce and the estimated willingness of the other sample to coproduce. In the left panel, citizens under the "trust in government" condition exhibit, on average, a willingness to coproduce at a level of 4.36, which is significantly higher (p-value = 0.00) than the average of 4.02 observed among citizens under the "distrust in government" condition. Public officials in the "trust in government" condition show an average willingness to coproduce at a level of 4.83, which is marginally higher (p-value = 0.09) than the 4.70 average for public officials in the "distrust in government" condition.

Figure 2: Point Estimates of Actual and Estimated Willingness to Coproduce



The right panel of Figure 2 displays the second-order beliefs regarding coproduction held by citizens and public officials. Shown in orange dots, citizens estimate that 51% of public officials are willing to coproduce in the "distrust in government" condition, and this estimation significantly rises (p-value = 0.00) to 61% in the "trust in government" condition. Shown in blue dots, public officials estimate a 22% willingness among citizens to coproduce

in the "distrust in government" condition, and this estimate slightly increases to 23% in the "trust in government" condition, a change that is not statistically significant (p-value = 0.54).

We formally evaluate the impacts of trust on both actual and perceived willingness to coproduce using linear regression models, as shown in Table 3. Models (1) and (2) illustrate the effects of trust in government on the actual willingness to coproduce among both citizens and public officials. Model (1) suggests that when fellow citizens have a high level of trust in government, citizens' willingness to participate in the disaster resilience planning forum increases by 0.34 points compared to when there is a general distrust in government among fellow citizens. However, this effect does not extend to public officials in Model (2). Variations in citizens' trust levels do not affect public officials' decisions to incorporating citizens' input in disaster resilience planning.

Table 3: Regression Analysis of the Trust-Collaboration Link

	Actual: Willingness to Coproduce		Estimated: Willingness to Coproduce	
	Citizens	Officials	Citizens	Officials
	(1)	(2)	(3)	(4)
Trust in Government	0.339	0.130	0.008	0.103
	(0.072)	(0.076)	(0.012)	(0.012)
	$p = 0.000$	$p = 0.088$	$p = 0.543$	$p = 0.000$
Constant	4.019	4.697	0.218	0.506
	(0.051)	(0.054)	(0.009)	(0.009)
	$p = 0.000$	$p = 0.000$	$p = 0.000$	$p = 0.000$
R^2	0.015	0.003	0.000	0.046
Observation	1445	981	950	1445

Notes: Standard errors are reported in parentheses.

Models (3) and (4) in Table 3 present the effects of trust in government on the estimated willingness to coproduce. Model (3) reveals that public officials do not anticipate a rise in the percentage of citizens willing to participate in disaster resilience planning as a function of increased trust in government. Conversely, Model (4) shows that citizens expect a 10% increase in the likelihood of public officials incorporating their input into disaster resilience

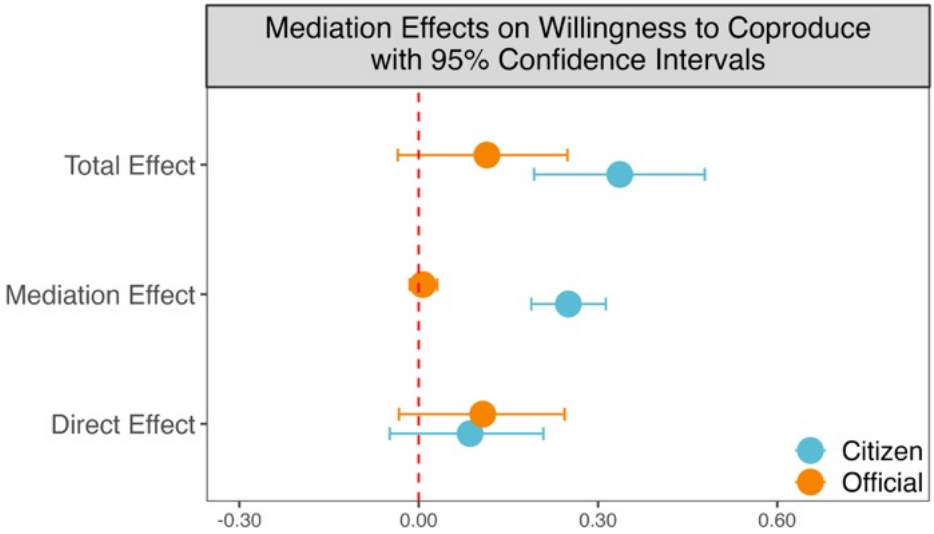
planning when public trust in government is increased.

Overall, H1 and H2 are partially supported. The trust-collaboration link is confirmed in the citizen sample; citizens also anticipate that public officials will be more willing to coproduce as public trust in government increases. However, public officials' willingness to coproduce does not shift in response to an increase in public trust in government. Furthermore, they do not predict a higher citizen participation in the coproduction process even when the level of public trust in government is elevated. We report the subgroup analyses for each trust factor in Appendix C.

4.2 H3: The Mediator Role of Estimation

We examined whether the estimated willingness to coproduce of the other party mediates the relationship between trust and actual willingness to coproduce. Following the method proposed by Imai et al. (2011), we employed the `R` package `mediation` to conduct causal mediation analysis. We present the results in Figure 3, which indicate the direct effects, mediation effects, and total effects for both citizens and public officials. The blue dots indicate that in the citizen sample, 25% of the effect of trust in government on the willingness to coproduce is mediated by citizens' estimation of public officials' willingness to coproduce. This mediation effect is crucial, considering that the direct effect of trust on coproduction is not statistically significant. The orange dots show that public officials' willingness to coproduce does not vary with public trust in government, and their estimates of citizens' willingness to coproduce do not mediate this non-effect. Therefore, H3 is only partially supported, with confirmation found solely within the citizen sample. We report the subgroup mediation analyses for each trust factor in Appendix D.

Figure 3: The Mediation Effects of Estimations on Willingness to Coproduce



4.3 Exploratory Analysis: Misperceptions between Citizens and Government

In this section, we examine the discrepancies in perceptions regarding the willingness to engage in coproduction among both citizens and public officials. In both Figure 4 and Figure 5, the upper portion of each panel represents results under the condition of trust in government, while the lower portion pertains to the condition of distrust in government.

Figure 4 illustrates the cell mean distributions for actual and estimated willingness to coproduce. The actual average proportion of willingness to coproduce in any given condition is depicted in light brown, while the estimated average proportion of willingness to coproduce is represented in light blue. Shown in the top panel, public officials significantly underestimate citizens' willingness to coproduce in both conditions of trust and distrust in government. However, the extent of this misperception is greater in the trust condition. On average, public officials underestimate citizens' willingness to coproduce by 55 percentage points under trust and by 46 points under distrust. Turning to the bottom panel, which presents the results for public officials, we find that their willingness to coproduce is likewise significantly underestimated by citizens. Nonetheless, the magnitude of citizens' misperceptions about public officials is less pronounced than vice versa. On average, citizens underestimate the

willingness of trustful officials to coproduce by 28 percentage points and that of distrustful officials by 33 percentage points.

Figure 4: Misperceptions on Willingness to Coproduce in Different Conditions

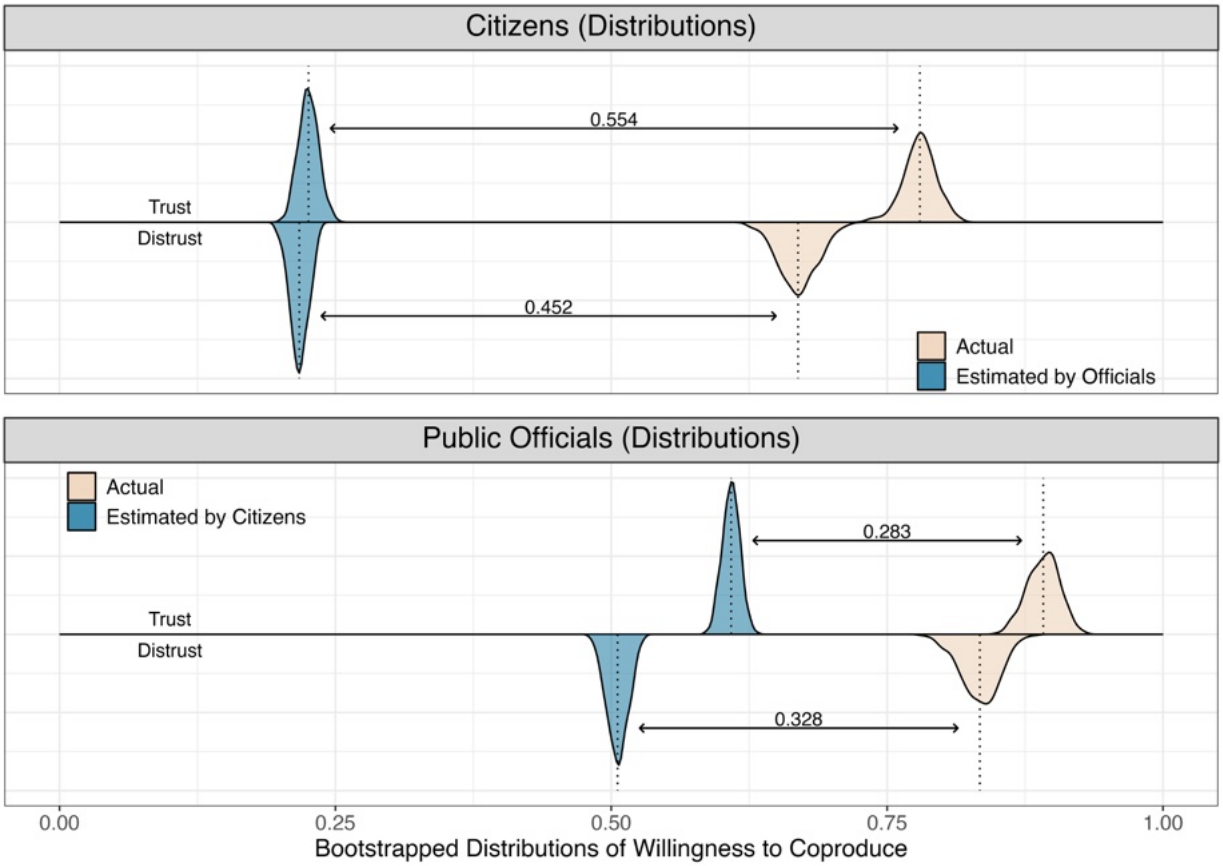
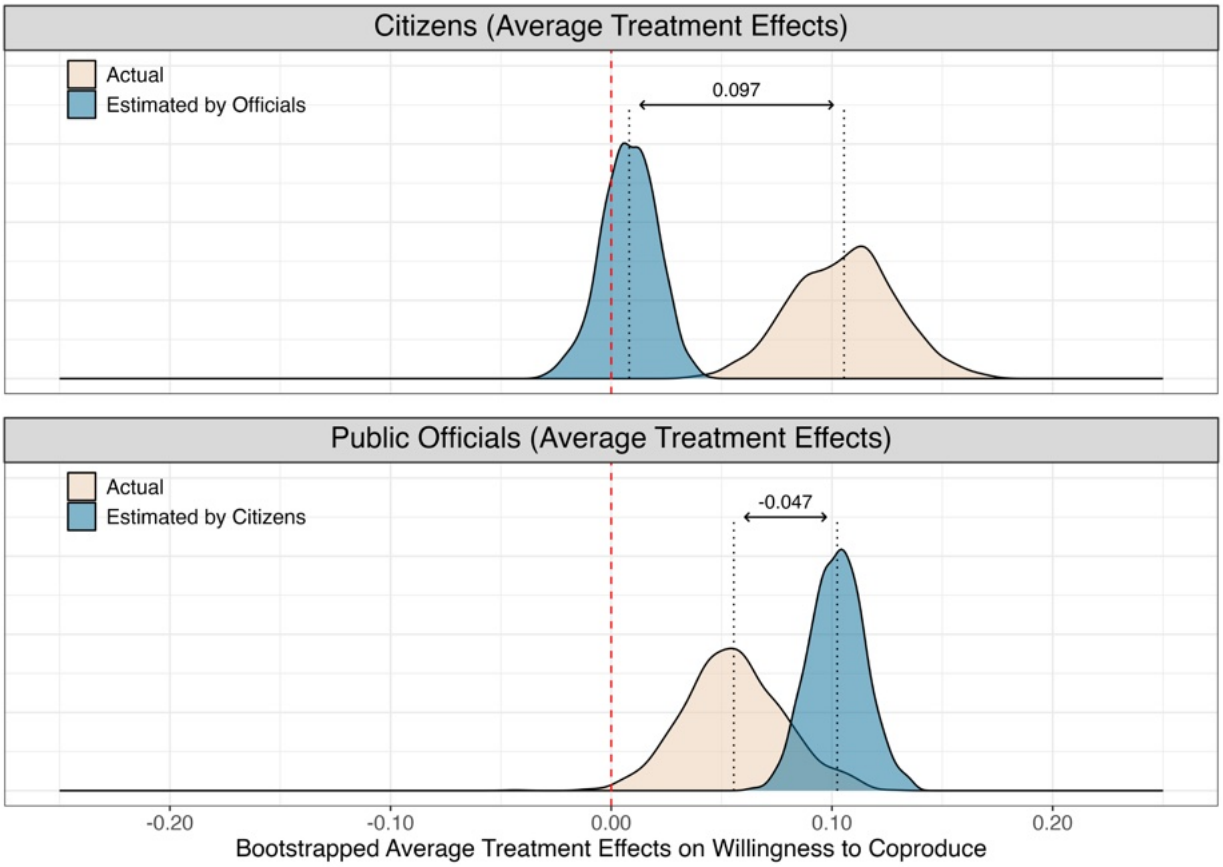


Figure 5 depict density distributions of bootstrapped average treatment effects. The distributions in light brown represent the average treatment effects of public trust in government on actual willingness to coproduce, and those in light blue reflect the average treatment effects on estimated willingness to coproduce. In the top panel, public officials estimate the effect of public trust on citizens' willingness to coproduce at 0.8 percentage points, which is 9 percentage points lower than the actual effect. Conversely, the bottom panel shows that citizens estimate the effect of public trust on officials' willingness to coproduce at 10 percentage points, which is 5 percentage points higher than the actual effect. Overall, public officials tend to underestimate the influence of public trust on citizens' willingness to coproduce,

whereas citizens are likely to overestimate its effect on officials' willingness to coproduce. We also present the subgroup analyses of bootstrapped cell mean distributions and average treatment effects for each trust factor in Appendix E.

Figure 5: Misperceptions on Average Treatment Effects of Trust



5 Discussion and Conclusion

Working in progress.

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Supplemental Information

Appendix A Summary Statistics

Table A.1: Summary Statistics of the Citizen Sample

Variable	Mean	SD	Min	Max	Balance Test (P-value)
Female	0.56	0.50	0.00	1.00	0.40
White	0.63	0.48	0.00	1.00	0.61
Age	43.00	16.02	18.00	85.00	0.02
Education	3.85	1.59	1.00	7.00	0.21
Republican	0.25	0.43	0.00	1.00	0.29
Democrat	0.33	0.47	0.00	1.00	0.77
Conservatism	2.96	1.09	1.00	5.00	0.01

Table A.2: Summary Statistics of the Public Official Sample

Variable	Mean	SD	Min	Max	Balance Test (P-value)
Female	0.35	0.48	0.00	1.00	0.70
White	0.78	0.41	0.00	1.00	0.54
Age	56.50	12.95	23.00	100.00	0.67
Education	5.55	1.13	2.00	7.00	0.75
Republican	0.25	0.44	0.00	1.00	0.90
Democrat	0.45	0.50	0.00	1.00	0.29
Conservatism	2.87	0.95	1.00	5.00	0.77

Appendix B Email Invitation

Subject line: Survey Research Invitation

Dear [Job Title] [Last Name]

We are researchers at [institution name], which unites scholars and forward-looking local government leaders to address challenges to sustainable development and resilience in our communities. Today, we kindly invite you to participate in a brief, 5-minute survey focused on collaborative decisions in local government management. This survey, conducted via Qualtrics, is designed to gain valuable insights into this important area.

Follow this link to the survey: [survey link is here]

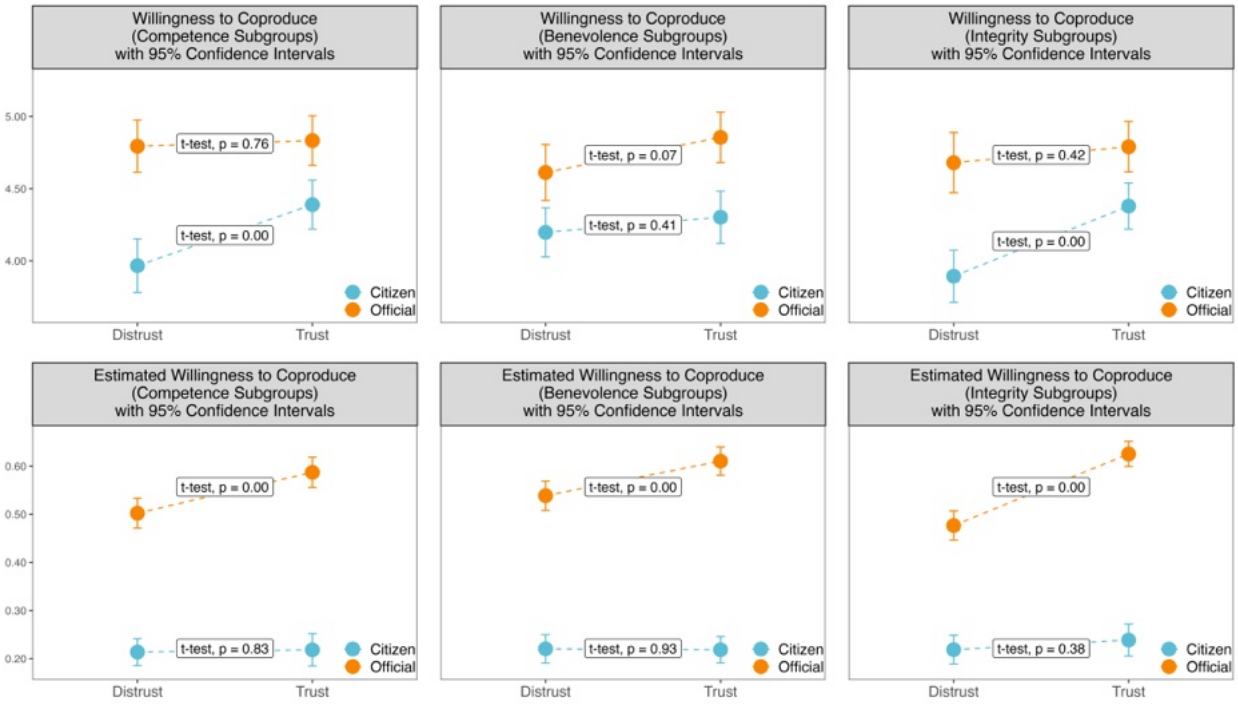
Our objective is to use the findings from this research to assist government leaders in improving their communication strategies with citizens and other government agencies. Rest assured, your responses will remain confidential and your participation is entirely voluntary. Feel free to withdraw from the survey at any point, should you choose to. If you have an interest in discussing potential collaboration further, we invite you to reach out to us directly at [researcher email].

We appreciate your time and consideration in contributing to this important study, and we eagerly await your response.

Your sincerely

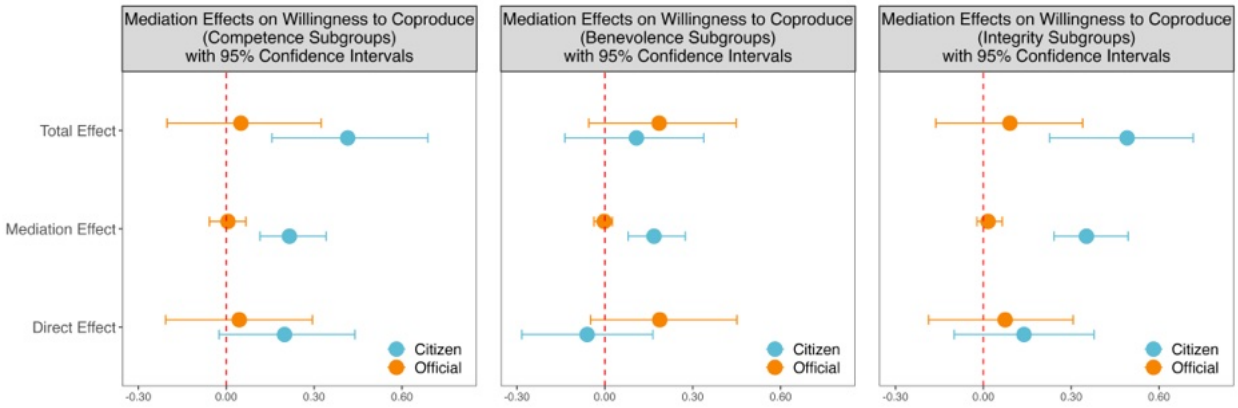
Appendix C Point Estimates in Trust Subgroups

Figure C.1: Point Estimates in Trust Subgroups



Appendix D Mediation Analysis in Trust Subgroups

Figure D.1: Mediation Analysis in Trust Subgroups



Appendix E Misperception Analysis in Trust Subgroups

Figure E.1: Misperception Analysis in Competence Subgroups

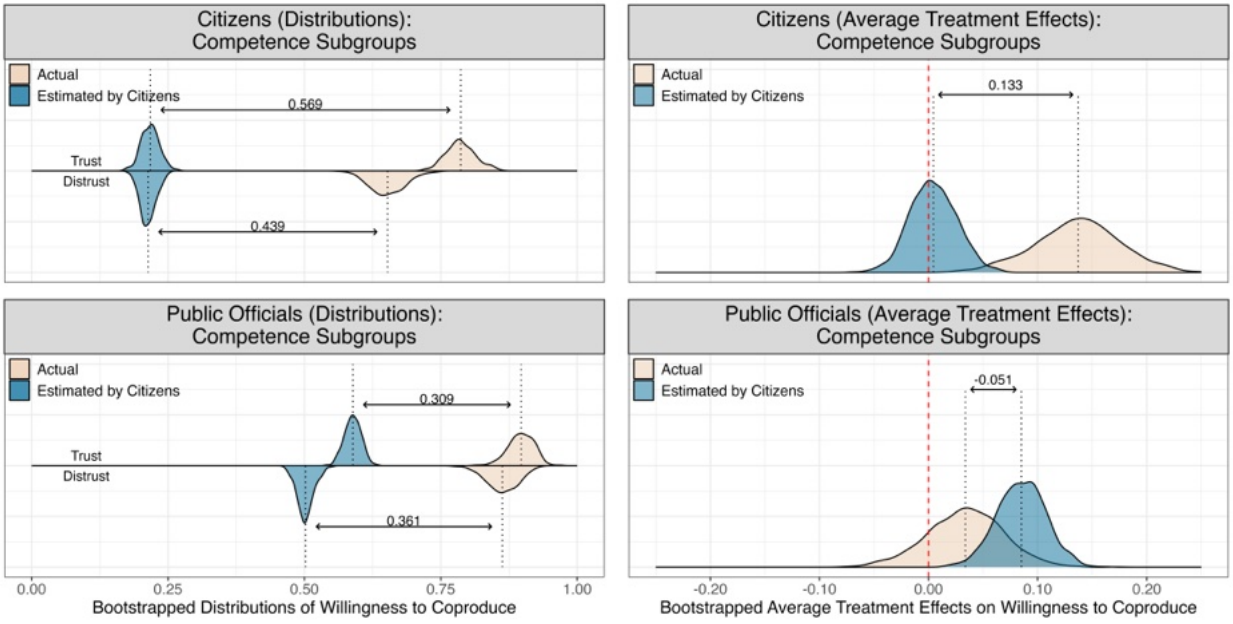


Figure E.2: Misperception Analysis in Benevolence Subgroups

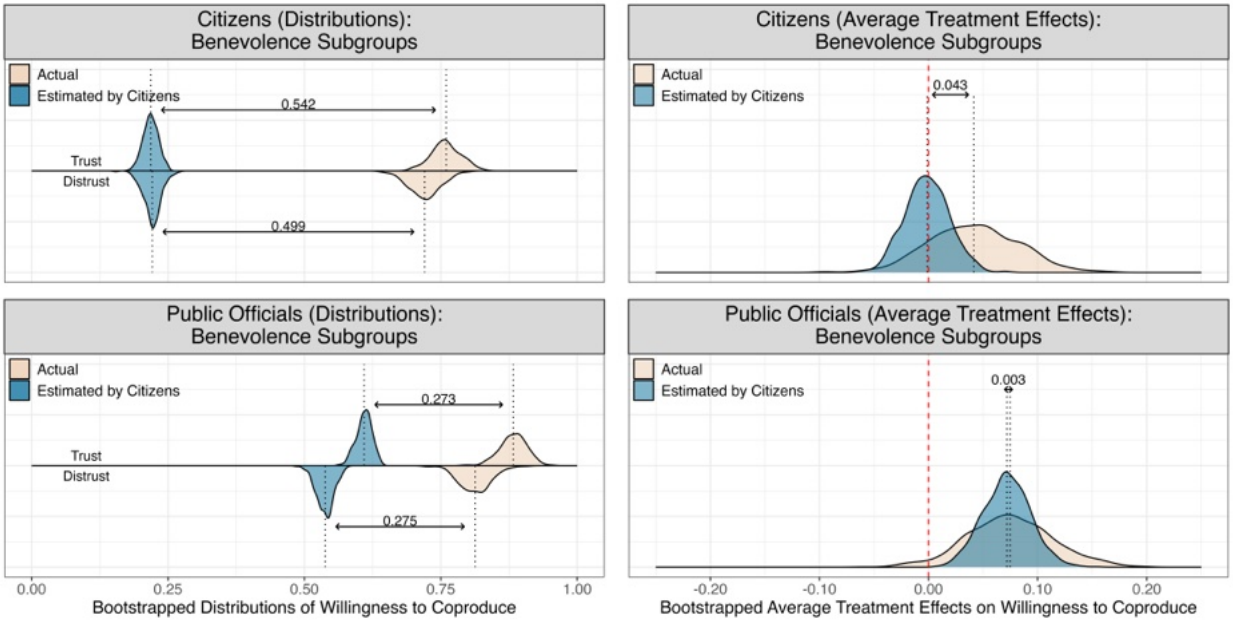


Figure E.3: Misperception Analysis in Integrity Subgroups