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Only hearing what they want to hear

Only hearing what they want to hear:

Assessing when and why performance information triggers intentions to coproduce

Abstract

While performance information is often used to communicate the importance of public policies and stimulate civic engagement, we know little about the processes that connect the two. This study proposes a conceptual model that links performance information to a specific form of public engagement - coproduction. Drawing on insights from information aversion theory, we argue that the effect of performance information on engagement in coproduction depends on levels of policy understanding and the valence of performance information individuals are exposed to. Specifically, we predict individuals exposed to positive performance information will understand the policy better than those exposed to negative performance information. Further, we predict higher levels of policy understanding will increase coproduction engagement intentions. These predictions are examined using two experiments and a representative sample of US residents (n=836). Findings indicate participants best understood positive information and that understanding significantly increased coproduction engagement intentions.

Academics, practitioners, and civil society organizations promote performance information disclosure as a mean of improving the quality of democratic governance. At its core, this argument rests on a conviction that public disclosure of performance information is necessary for governments to meaningfully engage the public in processes that govern the creation, delivery, and evaluation of public services (James & Moseley, 2014; Mizrahi & Minchuk 2019). Yet, while such advocacy has inspired a number of reform movements that seek to make government more open and the public more engaged and collaborative, evidence indicates the relationship between efforts to increase public access to government information and different forms of civic engagement is, at best, "opaque and unpredictable" (Kosack & Fung, 2014, p. 66).

We address this sticking point in public administration theory and practice. Building on research related to framing effects (Tversky & Kahneman, 1981), which shows that individuals respond to positive and negative information differently, and information aversion theory (Ganguly & Tasoff, 2017; Karlsson, Loewenstein, & Seppi, 2009), which shows that individuals pay more attention to good news than bad, we argue that individuals better understand policies when they are discussed from the perspective of public service improvements and understand policies worse when they are discussed from the perspective of preventing public service failures. Further, we argue that when individuals understand policies and why they matter, they are more likely to contribute to the policy's success by, for example, engaging in coproduction initiatives. In other words, we predict that using positive performance

information to explain the impacts of coproduction policies will be more effective than negative performance information at triggering intentions to engage in coproduction because positive performance information is more effective at increasing policy understanding.

We design a set of randomized survey experiments and a novel measure of coproduction engagement intentions to test our predictions. As the setting for our experiments, we focus on school improvement plans. School improvement plans are policies that are created annually to communicate school performance and measures adopted by individual schools and school districts to address issues related to student performance. As with most policies, efforts to convey the salience of a school improvement plan involve a choice between emphasizing benefits if the policy succeeds or the problems if it fails. School improvement plans are relevant to the purposes of this study because they not only publicly disclose performance information, but also communicate opportunities for members of the public to engage with public schools.

Our analyses reveal turn back three key findings. First, participants exposed to positive performance information (prospective improvement to service quality if policy succeeds) understood the school improvement plan better than participants exposed to negative performance information (prospective deterioration of service quality if policy does not succeed). Second, they reveal that participants who understood the school improvement plan were more inclined to engage in coproduction. Third, they show that exposure to negative performance information indirectly increases coproduction engagement intentions by first increasing policy understanding. These findings narrow gaps between theory and practice by shedding light on a causal mechanism responsible for translating

exposure to performance information into a better informed, engaged, and collaborative public. Whereas past research highlights a negativity bias in responses to performance information (Belardinelli, Bellé, Sicilia, & Steccolini, 2018; George et al., 2020; Nielsen & Moynihan, 2016) our findings intimate that activating this emotional response may cloud individual's ability to internalize performance information and thoughtfully respond to it. We will revisit these points later in the manuscript.

Conceptual Framework

Engagement in Coproduction

Civic engagement refers to a range of activities where members of the public are afforded opportunities to interact with a government organization to directly or indirectly affect their own wellbeing, as well as that of the community they live in (Delli Carpini, 2000). For example, members of the public can engage with government to assist in the provision of public services by volunteering at public libraries and participating in litter clean-up programs, or they can engage with government in attempt to hold public officials accountable by voicing discontent in town hall meetings (Roberts, 2004).

Our focus is on members of the public engaging with government to assist with the provision of a public service, which tracks closely onto the notion of public service coproduction (Nabatchi, Sancino, & Sicilia, 2017). Coproduction refers to: "a relationship between a paid employee of an organization and (groups) of individual citizens that requires a direct and active contribution from these citizens to the

work of the organization" (Brandsen & Honingh, 2016, p. 5). Policies targeting citizen-based coproduction promise to enhance the responsiveness of public service delivery by directly incorporating unique experiences and information accumulated by citizen service users into the processes of designing, delivering and evaluating public services (Brudney & England, 1983; Osborne, Radnor, & Strokosch, 2016).

To understand what citizen engagement in coproduction means for public service delivery, Nabatchi and colleagues (2017:773) distinguish between four types of coproduction that can result from individual citizens collaborating with public organizations – co-commissioning, co-design, co-delivery, and co-assessment. Co-delivery of public services, which is what we focus on, is a concurrent form of coproduction in that it focuses on improving a service that already exists (Nabatchi et al., 2017). A common example of this form of coproduction is in public schools (Pestoff, 2006). Here, members of the public volunteer their time to assist schools in providing education to students by engaging in activities, such as coaching teams, planning school events, or mentoring students in after school programs. Given the broad social benefits of education, as well as the normative value we assign to education (everyone should have equal access to quality education), there is an incentive for parents, as well as non-parents to engage in the coproduction of education.

Why Does Exposure to Performance Information Influence Engagement in Coproduction?

Performance information disclosure is "an indispensable element in modernizing the public sector" (Bouckaert & Peters, 2002, p. 359) and central to government efforts to engage the public in activities that govern the delivery of public services, such as coproduction. Efforts to explain the linkage

between exposure to difference types of government information, such as performance information, and

engagement frequently draw on insights from expected utility theory (Bauhr & Grimes, 2014). The

argument is that public access and subsequent exposure to performance information will help citizens

better understand how and why they can make a difference that, in turn, will lead to greater civic

engagement in activities such as coproduction (Thomsen 2017). From the expected utility perspective,

exposure to performance information stimulates engagement in coproduction because it improves

understanding of why it matters. That is, policy understanding mediates the relationship between

exposure to performance information and engagement in coproduction.

    More recent research suggests the effects of performance information on outcomes such as

understanding and engagement are not only attributable to exposure, but also how this information is

being communicated (Alon-Barkat, 2019; Olsen, 2015). The common theme is that variation in the way

governments communicate a message to the public carries significant consequences for public decision-

making (Porumbescu, Bellé, Cucciniello, and Nasi, 2017). We extend this research to offer a richer

understanding of how different features of government information can indirectly and substantively

shape engagement in coproduction. To elaborate on understanding as a causal mechanism, we focus on

differences in the way anticipated performance implications of government policies, such as school

improvement plans are explained to the public – whether the implications are explained in terms of

improving public service provision (positive performance information) or preventing public service

failure (negative performance information).

Both negative and positive performance information can convey a similar message to the public - that the performance implications of a proposed policy are important. Because both types of information can communicate the importance of public policies, they are frequently used interchangeably. As a clarifying example from a policy domain outside of education, consider the case of the Affordable Care Act (ACA), where the Obama Administration's explanations of the importance of the ACA were often framed in terms of its performance in increasing the number of insured individuals within a certain timeframe, or in terms of preventing the rapid growth in the number of uninsured within the same timeframe that would occur if current policies remained in place.

Hypotheses: Performance Information, Understanding, and Coproduction

We argue that negative performance information is less effective than positive performance information at stimulating engagement in coproduction because the latter is easier to understand. That is, policy understanding mediates the relationship between performance information and engagement in coproduction. The set of relationships that form the foundation for our conceptual model are illustrated in figure 1. We elaborate on this below.

<<<<<<Figure 1 here >>>>>>>>>>

Hypothesis 1: Performance information and policy understanding. Drawing on political knowledge research, this study conceives of understanding as a form of declarative memory (Prior & Lupia, 2008) that reflects individual recall of policy information. An individual's understanding of

information is a function of the content they are exposed to, their cognitive capacity, and motivation to engage with material (Sweller, 1994). Our interest is in assessing how the content, and more specifically the valence of performance information impacts individual understanding of that information.

Prior work demonstrates that responses to information depend on whether it is negatively or positively framed (Tversky & Kahneman, 1981, 1992). What is more, this difference arises when the negatively and positively framed information is logically equivalent. The effects that are attributed to information frames result from a cognitive bias; meaning individuals are not carefully evaluating the information they are exposed to. A main take away from this research is that framing matters to evaluations and decisions.

In this study, we focus on positive and negative information; however, we are not evaluating the effects of equivalence framing and related cognitive biases (Druckman, 2004) for the following reasons: First, performance information illustrating how a policy will prevent public service failure (negative performance information) is not logically equivalent to performance information explaining how a policy will improve public service provision (positive performance information). Second, our intention is to shed light on how the valence of performance information impacts understanding of government information, as opposed to, assessing how different frames evoke innate cognitive biases. Put differently, we are not focusing on automatic responses to information framing, but rather how the valence of performance information influences how carefully an individual pays attention to a message.

As mentioned earlier, governments frequently use positive and negative performance information to communicate policy importance. However, altering the valence of performance

information sends different signals about a government's underlying administrative capacity to effect change (Bauhr & Grimes, 2014). Specifically, disclosing negative performance information to illustrate how public service provision will continue to decline unless a policy is adopted (i.e., avert public service failure) conveys a history of administrative incompetence (Lubell, Zahran, & Vedlitz, 2007). Conversely, positive performance information that projects how a policy stands to improve service provision is forward-looking highlight optimism and progress (Valkenburg, Semetko, & De Vreese, 1999). In other words, using negative performance information to communicate policy importance highlights past problems, whereas using positive information for the same purpose highlights a better future.

Research on information aversion theory (Andries & Haddad, 2017) suggests these different approaches to communicating policy importance, and the subsequent signals they send about the underlying administrative context will determine the extent to which a member of the public is able to recall the performance information they are exposed to. This is because, as Gul (1991) shows, individuals have innate information preferences – they pay more attention to positive, aspirational information, and avoid engaging with negative information. Elsewhere, this tendency is referred to as the *ostrich effect* (Karlsson et al., 2009) in that people are more active in tending to good news, but "put their heads in the sand" to avoid bad news. To this end, studies have shown that investors pay less attention to financial forecasts in bear markets (e.g., underlying market conditions are bad), but pay more attention to financial forecasts in bull markets (i.e., underlying market conditions are good) (Galai & Sade, 2006). Similarly, Sicherman, Loewenstein, Seppi, and Utkus (2016) find investors pay less

attention to their investments following market declines. Thus, the key implication is that innate information preferences lead individuals to pay less attention to negatively framed information, even though inattention may adversely impact decision quality, but pay more attention to positively framed information, even when doing so may be of no benefit to decision-making (Alvarez, Guiso, & Lippi, 2012). Given that attention to information is intimately related to understanding information, we predict the following:

H1: Individuals exposed to positive performance information will understand the policy information they are exposed to better than individuals exposed to negative performance information.

Hypotheses 2 and 3: Policy understanding and engagement in coproduction. Individuals are more inclined to engage in efforts to elicit coproduction when they understand why their engagement matters (Mees, Crabbé, & Driessen, 2017). Work by Bandura (1986, p. 228) on self-efficacy and social cognitive theory speaks to this point: "unless people believe they can produce desired effects and forestall undesired ones by their actions, they have little incentive to act. Whatever factors may operate as motivators, they are rooted in the core belief that one has the power to produce desired results." Prior empirical research supports this point. For example, Parrado, Van Ryzin, Bovaird, and Löffler (2013, p. 85) examine correlates of coproduction in public safety, environmental, and health issues across five nations and find that across all sectors and nations self-efficacy is "an especially important determinant."

Relatedly, Lo and colleagues (2015) demonstrate that residents were more likely to engage in flood mitigation efforts when the government explained how such efforts would impact their community.

On average, improving an individual's understanding of a policy establishes a basis for increasing self-efficacy by eliciting the "core belief" that engagement matters. This is because a better understanding of a public policy, such as a school improvement plan is associated with a greater awareness of 1) the distinct contributions an individual can make to the success of the policy and 2) the value of those distinct contributions (cf. Bandura, 1977, pp. 198-199). That is, on average, understanding motivates individuals to engage with government by raising their awareness of why and how their involvement matters. As Thieken et al. (2007) explain, even if residents want to coproduce, not knowing what to do and the importance of different measures represents a hard constraint that precludes engagement in coproduction.

Because understanding plays an important role in shaping an individual's engagement in coproduction, we predict that better policy understanding increases engagement in coproduction. Further, because positive performance information is expected to, on average, improve policy understanding, we also hypothesize an indirect effect, such that exposure to positive performance information will increase policy understanding, which in turn will increase engagement in coproduction.

H2: Policy understanding will increase levels of engagement in coproduction.

H3: Exposing participants to positive performance information will indirectly increase individual engagement in coproduction, by first increasing their levels of policy understanding.

Method and Data

Research Setting and Design

To examine the effect of performance information valence on policy understanding and engagement in coproduction we focus on school improvement plans. School improvement plans are well suited for our purposes for the following reasons. First, school districts, which are the subject of school improvement plans, are one of the most common forms of local government in the United States, meaning that all participants will possess a general awareness of the function this unit of government serves and its importance. Second, funding for public schools and their performance is a contentious issue across the country and is a perennial point of discussion. To help schools do more with less, policies encouraging members of the public to engage with schools and school districts to assist with governance and service provision issues are popular (Addi-Raccah & Ainhoren, 2009). Coproduction oriented policies are popular because they represent a flexible, efficient and effective means of improving the quality of education for students. Third, to inspire members of the public to participate in afterschool programs, school districts rely on tools such as performance improvement plans to communicate how the public can play a role in efforts to improve the quality of education in public schools. To encourage greater diversity in terms of engagement, broad implications (not just for education, but for the entire community) are communicated to the public.

Modeling our study on a school improvement plan, all participants were first told that rising costs of after-school program provision by public schools mean the school district may not be able to carry on providing this service (after school programs) to the community. Participants were told that, in

an effort to drive down the high costs and continue providing after-school programs, the School Board was implementing a policy that depends on different forms of citizen inputs.

After reading the same background information, participants were randomly assigned to either experiment 1 or 2 (this is discussed at greater length in the *Estimation Strategy* section of the manuscript below). Following random assignment to an experiment, participants were then randomly assigned to a treatment group. All treatments began by providing information about what coproduction means within the context of this policy initiative (due to space constraints, appendix 2 provides illustrative examples of treatments. All materials are available upon request). Treatments differed according to whether the effects of the policy to encourage citizen coproduction were explained using (1) positive performance information (i.e., how the policy was going to improve the quality of education) or (2) negative performance information (i.e., how the policy was going to avert a decline in public service provision). The design of the treatments was such that the positive and negative performance information treatments spoke of the same performance implications, but in different directions. The performance implications were balanced to enhance comparability. For example, participants assigned to the positive performance information treatment group were told if the policy succeeded, 230 new jobs were expected as a result of the policy indirectly rejuvenating the local economy by attracting new businesses to the community. Conversely, participants in the negative performance information condition were told if the policy failed 230 *fewer* new jobs were expected, which would have resulted from the policy indirectly rejuvenating the local economy by attracting new businesses to the community. Similarly, subjects were told student

test scores were expected to be 12.2 points higher or lower depending on whether they were assigned to the positive or negative performance information treatments.

Participants were then directed to complete the same survey, where they answered questions assessing their policy understanding and carried out a series of tasks to measure their levels of engagement with government.

Estimation Strategy

Our hypotheses predict a direct effect of performance information valence on policy understanding (1), a positive relationship between policy understanding and engagement in coproduction (2) and, an indirect effect of performance information on engagement in coproduction via policy understanding (3).

Causal estimates of indirect effects using a single survey experiment are challenging because while participants are randomly assigned to a treatment (i.e, positive or negative performance information) the mediator (i.e., policy understanding) and outcome (i.e., intentions to engage in coproduction) are both measured. The lack of randomization to the mediator variable means we cannot rule out the possibility of a confounding variable biasing our estimates of the relationship between the mediator and outcome variables. As a result, causal estimates of indirect effects can be severely biased within the context of a single survey experiment.[1] To reduce this risk we use a parallel encouragement

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[1] For a detailed explanation of why, see Imai, Keele, Tingley, and Yamamoto (2011:780-781).

design. In a parallel encouragement design, participants are randomly assigned to one of two experiments run simultaneously.

The first experiment is a standard between-subjects survey experiment where participants are randomly assigned to either positive or negative performance information and responses to both the mediator (policy understanding) and the outcome (engagement in coproduction) are measured. Hypothesis 1 is examined using a univariate analysis of variance (ANOVA) and hypothesis 2 using ordinary least squares regression. To test hypothesis 3, we use a counterfactual framework developed by Imai and colleagues (Imai, Keele, Tingley, & Yamamoto, 2011). Here, the indirect effect is estimated using the following structural equation: $Y_i = \alpha_i + \beta_i T_i + \gamma M_i + \varepsilon_i$, where Y represents our outcome, engagement in coproduction, T our treatment, performance information valence (t_1 = exposure to positive performance information, t_0 = exposure to negative performance information), and M our mediator, policy understanding. We first estimate a value of our outcome, Y, using the value of the mediator calculated for those exposed to positive performance information ($m(t_1)$). Next, once again we calculate the outcome for those exposed to positive performance information, but this time use a value of the mediator for participants exposed to negative performance information ($m(t_0)$). The Average causal mediated effect is then identified as: $Y_1(t_1, m(t_1)) - Y_2(t_1, m(t_0))$. Estimates from this initial experiment represent a baseline.

The second experiment is also used to test all three hypotheses, but here participants, in tandem with the delivery of treatment, are randomly encouraged to take high or low values of the mediator. Functionally, the encouragement (explained below) acts as a second treatment, meaning this experiment

uses a 2X2 between-subjects ANOVA estimation strategy. By using the randomly assigned encouragement to cluster participants into one group taking higher values of the mediator and a second taking lower values of the mediator we hedge against the prospect of an unobserved confounding variable biasing the relationship between the mediator and outcome variable (Imai, Keele, & Tingley, 2010). We estimate relationships predicted by our hypotheses as done in the preceding experiment.

The novelty of the parallel encouragement design is that it allows us to examine direct and indirect effects across different operationalizations of the mediating variable - high values and low values, which result from the randomly assigned encouragement, and the measured values, which come from the baseline experiment (Fabrigar & Wegener, 2016). In the context of this study, where we predict engagement in coproduction to increase as policy understanding increases, we expect to see the indirect effect size larger for participants encouraged to take higher values of the mediator when compared to participants encouraged to take lower values of the mediator.

Participants

We use a representative sample taken from the general United States' population. Participants were 836 adults who were paid as part of a panel of survey response panel based in the United States operated and maintained by the online survey firm *Qualtrics*. Participants were invited by *Qualtrics* to participate in the study via email where they could follow a link leading to the stimuli and subsequent survey. Quota sampling was used to ensure the sample was representative of the American population on parameters of gender, age, income, and education. Characteristics of the sample by treatment group can be found in appendix 1. A chi-squared test revealed successful randomization as none of the

differences found across the groups with respect to the aforementioned sampling parameters was significant ($p > .05$).

Measures of key variables

Policy Understanding (Mediating Variable). Our measure of policy understanding is informed by research from political science and educational psychology. Studies from these disciplines assess the general construct of understanding by asking study participants to respond to a series of closed-ended questions about a particular issue or information they have just read (Mangen, Walgermo, & Brønnick, 2013). More correct responses indicate greater policy understanding, which in this study refers to participants' understanding of the school improvement plan they read. Following this procedure, we measure policy understanding by asking participants, irrespective of their treatment group, the same *thirteen multiple-choice questions* related to the prompt they read. We then summed their responses to create an additive index, where a score of twelve corresponded to the highest possible level of policy understanding and a score of zero corresponded to the lowest possible level of policy understanding. Examples of items can be found in appendix 2. We do not include the full list of items due to space constraints, but will provide them upon request.

Time of exposure (encouragement). Our analyses are informed by two experiments: The first experiment does not include an encouragement, meaning that levels of policy understanding are measured, whereas the second experiment randomly encouraged participants to take different levels of policy

understanding. Participants in the second experiment were encouraged to take different levels of policy understanding by fixing the amount of time they were exposed to the treatment: i.e.*; short exposure (30 seconds) or long exposure (90 seconds)*. This was done by programming the survey such that participants assigned to the short exposure encouragement (or discouragement) had their survey locked on the treatment for 30 seconds. After the 30 seconds expired, the survey automatically navigated to the next page – participants were not able to navigate back to the preceding page. For participants assigned to the long exposure encouragement, the survey locked on the treatment for 90 seconds. After the 90 seconds elapsed, the survey automatically navigated to the next page – participants were not able to navigate back to the preceding page. We find that our encouragement, time of exposure to policy information, has no direct effect on the outcome (engagement) ($F(2, 12) = .469$, $p = 0.626$). Those assigned to the short exposure, on average, had lower levels of policy understanding (*m* = 3.85, SD =1.79) than those assigned to the long exposure *(m = 4.82, SD = 2.14)*. This difference was statistically significant ($F(1, 544) = 44.522$, $p < 0.000$). Participants assigned to the first experiment, which did not include an encouragement (they were allowed to look at the treatment for however long they liked), on average, correctly answered 4.54 (SD = 2.14) policy-understanding questions. All told, the data suggest our encouragement worked (Imai et al., 2011).

For ease of interpretation we refer to the group encouraged to assume higher levels of policy understanding as the '*high understanding group*,' those encouraged to assume lower levels of policy understanding as the '*low understanding group*,' and those who did not receive the encouragement as the '*measured understanding group*.'

Coproduction Engagement Intentions (Outcome Variable). To assess levels of participant engagement in coproduction we use a real effort approach (Brüggen & Strobel, 2007). In real effort experiments participants are assigned tasks that require an investment of resources, such as time or energy (Rosaz & Villeval, 2012). The idea is that asking participants to use resources (time or energy) and exert real effort, will offer a closer approximation to real life behavior than evaluating participants' stated intentions (e.g, using a Likert scale to evaluate participants' intentions to engage in coproduction).

Based upon the real-effort framework, we evaluate participants' intentions to engage in three types of coproduction. We use three types of initiatives to mitigate external validity concerns that may arise from dealing with only a single activity. Participants were told that the government was unable to dedicate administrative resources needed to launch the after-school program and that to overcome such constraints help from the public was needed. We do not include the full list of items due to space constraints but will provide items upon request. The items were aggregated and standardized to facilitate interpretation. Examples of items can be found in appendix 2.

In the first initiative, participants were asked to help the school district identify locations for afterschool activities. To do so, they were provided GPS coordinates and a list of eleven locations, and then asked to enter the GPS coordinates into Google Maps. Based upon what they found using Google Maps, they were then asked match GPS coordinates to a corresponding after-school activity from the list of locations. For example, if a set of GPS coordinates corresponded to a library, they would choose *chess club* from the list of activities. See appendix 2d for examples.

In the second initiative, participants were asked to review calculations that form the basis for budgets allocated to different afterschool programs. Participants were provided with calculations and then asked to choose the right response from one of four possible answers. Here, twenty items were used. The higher the number of correct answers, the greater the intention to engage.

For the third initiative, participants had to figure out the price of necessary afterschool program supplies based on their product numbers. For example, participants would be told to select the price for a math exercise with the product code XYZG4432118 from a list of ten similar product codes. Here, ten items were used. The higher the number of correct answers, the greater the intention to engage.

Some may question whether we are really measuring intentions to engage in coproduction given that our sample receives incentives to participate in experiments. While a valid concern, within the context of this experiment this issue is tenuous for two reasons. First, the study explains to all participants that they will receive the same participation incentive irrespective of whether or not they engage in the initiatives. Given the incentive is constant for those in our sample, we can safely assume variation we observe in this measure is due to treatments and the mediator and not some perceived personal incentive. Second, studies have shown small financial incentives, such as those provided to participants in our study, are an ineffective means of bolstering engagement in activities such as coproduction, when measured both as a stated and revealed preference (Voorberg, Jilke, Tummers, & Bekkers, 2018). That said, we acknowledge that measuring coproduction engagement intentions within the context of a survey experiment is a challenging endeavor and discuss limitations of the measurement approach taken in this manuscript in the limitations portion of the manuscript.

Results

Hypothesis 1 predicted that those assigned to the positively performance information will have higher levels of policy understanding than those assigned to the negative performance information. Findings from a univariate ANOVA support this hypothesis. Specifically, when examining the entire sample (n = 836), we find that, on average, participants who were randomly assigned to the positive performance information (m = 4.59, SD = 2.12) had higher levels of policy understanding than participants assigned to the negative performance information (m = 4.25, SD = 2.01) by .34 correct answers. Furthermore, this difference is statistically significant ($F(1, 834) = 5.59$, $p = 0.018$). *Mean values of policy understanding by treatment group can be found in table 1.*

<center><<INSERT TABLE 1 HERE >></center>

Hypothesis 2 predicts greater policy understanding will increase participant intentions to engage in coproduction. To examine hypotheses 2, we use the parallel encouragement experimental design explained earlier. We begin by reviewing results for experiment one, which is our baseline, and then discuss experiment 2 where participants were randomly assigned to take higher or lower levels of policy understanding through the use of an encouragement (high understanding versus low understanding).

Experiment 1: Recall that for participants assigned to experiment 1, levels of policy understanding were measured (i.e., measured understanding group) and, on average, levels of policy understanding for participants in experiment 1 fell just below that of the high understanding and above that of the low understanding groups. For participants in experiment 1, we find a significant positive

relationship between policy understanding and intentions to engage in coproduction ($B = .151$, SD = .03, $p = .010$). These findings are also illustrated in table 2.

Experiment 2: Table 2 shows estimates across the high understanding and low understanding groups. As can be seen, for participants randomly assigned to the *low understanding group* there is a lack of a significant effect of policy understanding on intentions to engage in coproduction ($B = .035$, SD = .04, $p = .578$). That is, for this group policy understanding did not increase intentions to engage in coproduction. By contrast, for participants that were randomly assigned to the *high understanding group*, we find a significant positive effect of policy understanding on participants' intention to engage in coproduction ($B = .170$, SD = .03, $p = .004$)[2]. Thus, for the group encouraged to have higher levels of understanding, we find that policy understanding does indeed increase intentions to engage in coproduction, as hypothesized.

<<INSERT TABLE 2 HERE>>

Hypotheses 3 predicts an indirect effect of performance information valence on participant intentions to engage in coproduction, via, policy understanding. As before, we begin by reviewing results for experiment one, which is out baseline experiment.

Experiment 1: For participants in experiment 1, the measured understanding group, we detect a statistically significant indirect effect of performance information valence on participant intentions to engage in coproduction, via policy understanding (*Indirect Effect* = -0.062, $p = 0.04$, CI95% -.159, -

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[2] The overall effect of understanding on participant intentions to engage in coproduction is also statistically significant ($B = .130$, SD = .02, $p = .000$).

.001). That is, exposure to the positive performance information improved levels of policy understanding, which in turn resulted in greater intentions to engage in coproduction. This means that a better understanding of the school improvement plan plays a crucial role in linking exposure to performance information to coproduction engagement intentions.

Experiment 2: For participants randomly assigned to the *low understanding group*, there is no significant indirect effect of performance information valence on intentions to engage in coproduction (*Indirect Effect* = -.004, *p* = .86, CI95% -.049, -.026). This means that, for the group with the lowest average level of policy understanding, shifting from negative performance information to positive performance information did not increase participants' understanding of the school improvement plan and, as a result, shifting from negative performance information to positive performance information did not influence coproduction engagement intentions.

For participants randomly assigned to the *high understanding group*, there is evidence of a significant indirect effect of performance information valence on intentions to engage in coproduction, via policy understanding (*Indirect Effect* = -.061, *p* < .05, CI95% -.140, -.002). That is, when compared to exposure to negative performance information, exposure to the positive performance information increased policy understanding, which in turn increased intentions to engage in coproduction. Thus, in contrast to the low understanding group, we find that in the high understanding group, understanding of the school plan was a critical mechanism responsible for linking the positive performance information to intentions to engage in coproduction.

Using this conceptual replication, we offer convergent evidence of school improvement plan understanding mediating the relationship between the valence of policy related performance information and participant intentions to engage in coproduction.

Discussion and Conclusion

Before discussing the contributions of this study, it is helpful to review how some of the research design choices that were made lay a foundation for future research. First, the mechanisms we focus on address intentions to engage in coproduction in a narrow policy initiative –an education program. However, studies suggest that that the public's responses to policy information will vary by domain (de Fine Licht, 2014). Therefore, conceptual replications of this study are needed to explore the extent to which our findings generalize to policy contexts outside of education. Second, we evaluate intentions to engage in coproduction with a hypothetical government as opposed to actual engagement with real government. Despite efforts to move beyond stated intentions to engage by employing a novel real-effort measure of engagement intentions, the extent to which intentions to engage in coproduction with a hypothetical government accurately predicts actual engagement with an actual government is unclear. To shed light on this issue, field experiments would prove useful in testing the degree to which our findings generalize to real world settings. These points notwithstanding, our findings establish a firm empirical basis for future research to build upon.

Limitations of this study notwithstanding, these findings advance public management scholarship by mapping out conditions and processes that are critical to translating performance information to coproduction. Below we discuss three key contributions from our analyses.

First, our findings build upon a growing body of performance information research that demonstrates evaluations of public sector performance are influenced by framing effects and a negativity bias, that results in performance evaluations being more heavily influenced by negatively framed performance information (Nielsen & Moynihan, 2016; Olsen, 2015). Our findings complement work on framing effects by demonstrating that, while exposure to negatively framed performance information may have an outsized effect on performance evaluations, individuals appear to understand positive policy performance information better than negative policy performance information. In line with information aversion theory, one reason for this may be that individuals tend to pay more attention to positive performance information (Ganguly & Tasoff, 2017; Karlsson et al., 2009), individuals might understand positive policy performance information better because of an aversion to negative information – individuals do not pay as close attention to negative performance information and therefore do not understand it as well. This finding is novel because it nuances debates over whether performance information is able to engender a more informed public by demonstrating that the answer to this question depends, at least in part, upon the way performance implications of government actions are explained. This finding also builds upon recommendations for practice (e.g., Connolly et al. 2019: 473), which stress the importance of keeping government information "clear" and "concise" in order to avoid confusing the public. Specifically, communicating in ways that avoid visceral responses, when

possible, may help citizens reflect more carefully on the information they are exposed to and more fully grasp the meaning of the information they are exposed to.

A second key finding pertains to the relationship between policy understanding and coproduction engagement intentions Through two experiments, we offer evidence of a causal effect of policy understanding on intentions to engage in coproduction. This means that, on average participants who understood the policy better were more inclined to engage in coproduction than those who understood the policy worse. While the consequences of an informed public are often the subject of positive speculation, such speculation has, to date, been subjected to scant empirical evaluation. Our findings empirically substantiate arguments pertaining to the benefits of an informed public by providing preliminary causal insight into the role policy understanding plays in stimulating coproduction engagement intentions. Put differently, our study is the first, to our knowledge, to causally demonstrate that individuals who understand public policies behave differently from those who do not.

Finally, conceptual discussions of the relationship between performance information and engagement focus on either accountability or public collaboration. To date empirical research has focused almost entirely on testing effects of information delivery on accountability, demonstrating that disclosure of negative government information, at least until an extent, mobilizes members of the public to hold government accountable (Bauhr & Grimes, 2014; James & John, 2006). We extend these findings by showing that disclosing information outlining the positive impacts of a public policy can also lead to greater, albeit a different form of engagement that is under-studied by performance information scholars – collaboration. In summary, these findings contribute to the research related to

performance information research by offering empirical insight into an often made, yet seldom tested claim, which is that greater information delivery can stimulate more collaborative relationships between members of the public and their government.

While extant theory positions performance information disclosure as a critical feature of government modernization efforts, it provides little insight into how to leverage it to effectuate a more engaged public. Our findings offer robust empirical insight into the conditions that underlie the effectiveness of performance information as a tool for fostering greater public engagement, with an emphasis on coproduction.

Tables

Table 1: Tests of between-subjects effects (Outcome variable: Policy Understanding)

	Type III Sum of Squares	Df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power
Corrected Model	24.002	1	24.002	5.591	.018	5.591	.656
Intercept	16340.127	1	16340.127	3806.029	.000	3806.029	1.000
Information Framing	24.002	1	24.002	5.591	.018	5.591	.656
Error	3580.547	834	4.293				
Total	19989.000	836					
Corrected Total	3604.549	835					

R Squared = .007 (Adjusted R Squared = .005)

Table 2: Effect of Policy Understanding on Engagement

|	High Understanding Group (High Exposure)		Low Understanding Group (Low Exposure)		Measured Understanding (No Time Constraint on Exposure)	
	Estimate	Estimate	SE	SE	Estimate	SE
Intercept	-0.613*	0.043	0.267	0.253	-0.388	0.265
Policy Understanding	0.127**	0.028	0.058	0.043	0.114*	0.047
Policy Information Frame	0.103	-0.322	0.208	0.184	-0.245	0.201
Adjusted r²	*0.013*		*0.002*		*0.118*	

*p<0.05, **p<0.01*

Figure 1
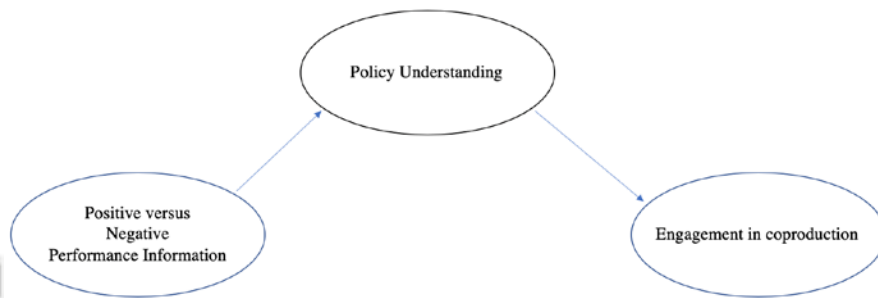
Figure 1: Conceptual model linking performance information to engagement in coproduction

Appendix 1: Sample Characteristics

	Negative Information X Encouragement (n = 153)	Negative Information X No Encouragement (n = 150)	Negative Information X Discouragement (n = 114)	Positive Information X Encouragement (n = 140)	Positive Information X No Encouragement (n = 140)	Positive Information X Discouragement (n = 139)
Gender%						
Female	62.1	56.4	50	59	64.7	50
Age %						
18-24	15.7	10.7	8.8	4.3	12	10
25-34	14.4	13.6	16.7	18.7	20	27.1
35-44	17.6	15.7	14.9	20.9	19.3	17.9
45-54	25.5	17.1	28.1	12.2	15.3	14.3
55-64	17	19.3	18.4	21.6	19.3	16.4
65-74	9.2	19.3	10.5	17.3	12	12.9
75+	0.7	4.5	2.7	5	2	1.4

Income %						
> $15,000	17	10.7	12.3	11.5	12	13.6
$15,000 - 29,999	11.1	18.6	16.7	18	17.3	13.6
$30,000 - 49,999	20.3	27.9	14	20.9	20.7	19.3
$50,000 to 74,999	19	12.9	14.9	22.3	16.7	17.9
$75,000 to 99,999	8.5	13.6	7	3.6	16	7.9
$100,000+	24.2	16.4	35.1	23.7	17.3	27.9
Political Affiliation %						
Republican	23.5	30.7	27.2	32.4	26	31.4
Democrat	37.3	30.7	39.5	41	38	37.1
Independent	30.7	32.9	23.7	19.4	30.7	27.1
Other	8.5	5.7	9.6	7.2	5.3	4.3
Education %						
High School or less	22.2	20.7	19.3	21.6	23.3	25
Some college	28.1	31.4	25.4	26.6	27.3	25.7
Associates degree	9.2	12.1	9.6	8.6	14.7	5.7
Bachelor's degree	23.5	20.7	29.8	31.7	21.3	29.3
Graduate degree	17	15	15.8	11.5	13.3	14.3
Mediating and outcome variables (Mean Values)						
Policy understanding	4.63 (SD =2.07)	4.26 (SD = 2.18)	3.77 (SD = 1.59)	5.05 (SD = 2.21)	4.81 (SD = 2.07)	3.91 (SD = 1.94)
Engagement Intention (standardized)	.051	-.08	-.157	.017	.097	.040

Appendix 2: Materials

Appendix 2.a: Negatively Framed Information

A joint analysis done by the City Finance Committee and Plain Valley School Board indicates that if not enough citizens sign up, the following is likely to result:

1. School day attendance, parent satisfaction with the Plain Valley School District and trust in government will be lower than they would otherwise be.

2. Reading test scores will be 12.2 points lower, math test scores will be 23.1 points lower, and science test scores will be 2.3 points lower.

3. City officials, in consultation with 32 local business leaders, anticipate that there will be 230 fewer new jobs, which would otherwise result from indirectly rejuvenating the local economy by attracting new businesses to the community.

4. Taxes for citizens will be higher because the failure of this initiative will preclude after-school program savings, which City officials in the finance department anticipate would otherwise allow the city to lower taxes for citizens after the first 2.5 years of operations.

5. The city has 53,549 school-aged children. Of these children, 27.4% are elementary school age, 38.8% are middle school age, and 33.8% are high school age. None of these children are expected to benefit from this policy without sufficient support from citizens.

Appendix 2.b: Positively Framed Information

A joint analysis done by the City Finance Committee and Plain Valley School Board indicates that if enough citizens sign up, the following is likely to result:

1. School day attendance, parent satisfaction with the Plain Valley School District and trust in government will be higher than they would otherwise be.

2. Reading test scores will be 12.2 points higher, math test scores will be 23.1 points higher, and science test scores will be 2.3 points higher.

3. City officials, in consultation with 32 local business leaders, anticipate that there will be 230 new jobs, which will result from indirectly rejuvenating the local economy by attracting new businesses to the community.

4. Taxes for citizens will be lower because City officials in the finance department anticipate that after-school program savings will allow the City to lower taxes for citizens after the first 2.5 years of operations.

5. The city has 53,549 school-aged children. Of these children, 27.4% are elementary school age, 38.8% are middle school age, and 33.8% are high school age. All of these children are expected to benefit from this policy with sufficient support from citizens

Appendix 2.c: Examples of Items used to policy understanding

Select all of the anticipated effects of the proposed plan that you read.

☐ The city will significantly alter its spending, while maintaining the same level of quality for all residents. (1)

☐ The city estimates it will alter the amount it spends on fuel for school buses on a yearly basis. (2)

☐ In the long-term, the city estimates it will change the average amount of city taxes residents pay every year. (3)

Appendix 2.d: Examples of Items used to measure engagement intention

At present, there are a total of 11 possible locations the city can allocate to the program. The city is asking citizens to help match available spaces to **7 of the different after-school programs** it intends to offer.

The coordinates of the 11 locations the city offers are provided below. Please cut and paste the coordinates we provide into google maps (https://www.google.com/maps) and match each of the locations to an appropriate activity.

You may need to zoom in or zoom out. In some cases, coordinates are not precise. If coordinates are near a space that you believe is suitable for one of the seven afterschool programs, please match that coordinate to the appropriate activity.

If coordinates provided do not correspond to an activity please select 'none.

	Soccer (1)	Chess (2)	Gardening (3)	Tennis (4)	Rowing (5)	Theater (6)	Math (7)	Football (8)	None (9)
42.287396, -83.772533 (Q45_1)	○	○	○	○	○	○	○	○	○

Q46 The city is asking citizens to help reviewing the program budget to avoid any budget errors. Please tick CORRECT or INCORRECT for each of the budget items below. **Please get hold of a calculator to perform this task.**

	.
	CORRECT (1) INCORRECT (2)

$ 2,978 x 7,967 = $ 23,725,726
(Q46_1)

◯   ◯

B. After school program

1. Exercise book

Model	Price
XYZG4432119	$12.91
XYZG4442119	$13.11
XYZV4433119	$12.22
XYZG4432139	$12.21
XYXV4432219	$13.71
XYZG4432118	$13.91
XYZG4532119	$13.22
XYZG3432119	$13.33
XXZG4432119	$13.18
XYZW4437119	$12.98

Please select the price of the exercise book Model XYZG4432118:

◯ $12.22 (1)

◯ $12.21 (2)

◯ $13.71 (3)

◯ $13.91 (4)

◯ $13.22 (5)

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