

Regulators as Guardians of Trust? The Contingent and Modest Positive Effect of Targeted Transparency on Citizen Trust in Regulated Sectors

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ABSTRACT

Targeted transparency has become an essential tool for regulation. Through information disclosure, regulatory agencies try to get regulated companies to improve their practices and comply with regulations. In the past, regulation was associated with distrust in regulated sectors. Recent research suggests that regulation, especially targeted transparency, may also increase citizen trust in regulated sectors. However, empirical evidence on whether transparency as a regulatory tool undermines or decreases trust in a sector is lacking. We contribute to this debate by investigating the effect of targeted transparency on citizen trust through a large-scale representative survey experiment ($n = 5,303$). We used 12 transparency frames in three regulated domains in the Netherlands (consumer rights, healthcare safety, and nuclear plant safety). Our findings suggest that, in general, targeted transparency does not undermine trust, but has a positive effect on trust in regulated sectors. However, this effect is small and contextual, depending on the regulatory domain and type of transparency frame.

Targeted transparency—the mandatory disclosure of information by private or public institutions with a regulatory intent (Weil et al. 2006)—has become an essential tool for regulatory agencies in the past decade (Etzioni 2014; Fung 2013; Meijer and Homburg 2009; Van Erp 2010). For instance, regulatory agencies publish information about which factories are most polluting, whether nuclear plants comply with safety rules, or whether e-commerce retailers properly inform consumers about their rights. Through such public disclosure, regulatory agencies attempt to force companies to improve their practices and comply with regulations (Fung, Graham, and Weil 2007).

A crucial question has yet to be answered: Does targeted transparency undermine or improve citizen trust in regulated sectors? A certain degree of distrust in specific untrustworthy companies might be the intent of a regulatory agency because slightly distrusting citizens may be less easily misled. At the same time, at the level of a sector or market as a whole, a degree of trust is required for it to function properly. Trust, on a basic level, is needed to foster cooperation and allow mutual business-like and personal dealings and interactions (Silver 1985, p. 56; Fukuyama 1995).

Despite its importance, there have been limited empirical studies on citizen trust in regulated sectors (Six and Verhoest 2017). Therefore, we test how targeted transparency affects trust by positioning this question in a broader and longstanding debate on the relationship between trust and regulation. Ever since “the rise of the regulatory state” in the 1980s and the 1990s (Levi-Faur 2011; Majone 2019) there has been a debate about the connection between regulation and trust. The idea

is that strong regulatory oversight is not needed when social actors can trust each other (Moran 2002) and that “rituals of verification” are needed in situations of low trust (Power 1997). According to the classic regulation theory, there is a trade-off between regulation and trust: if there is little trust in regulations, stronger regulation is necessary; and vice versa, stronger regulation may substitute trust (e.g., Aghion et al. 2010; Ayres and Braithwaite 1992). More recently, however, regulation and trust have been argued to be complementary: regulation and regulatory oversight are needed to create trust in regulated sectors (Six 2013). Regulation may breed trust and regulators, then, could be seen as “guardians of trust” (Sparrow 2000) who, by actively supervising a sector, instill public trust in this sector (e.g., Maman et al. 2022). Transparency, as a regulatory instrument, has not been explicitly considered in this regulation-trust debate, which is remarkable because it is generally acknowledged that this has become an important form of regulation (Etzioni 2010; Fung et al. 2007; Meijer and Homburg 2009).

Overall, we contribute to the regulation and trust debate by testing whether targeted transparency lessens or contributes to citizen trust in regulated sectors. Furthermore, we provided a more sophisticated understanding of this relationship. Transparency is more than simply disclosing “more” information but also concerns the way information is brought to people (Fung et al. 2007; Piotrowski et al. 2019). Therefore, we investigate four common information frames from performance information studies (James et al. 2020) which, so far, have been untested with regard to regulatory transparency.

In summary, the following question is central: *What is the effect of targeted transparency on citizen trust in regulated sectors?*

We answered this question by conducting a large and representative survey experiment in the Netherlands ($n = 5,303$). Our findings show a direct relationship between targeted transparency and trust in a sector. This effect is positive but modest. Furthermore, we found that the strength of the effect depends on the specific framing of transparency and the regulatory domain to which it is applied.

Targeted Transparency as a Form of Regulation

Definitions of government transparency often include the availability of information on decision-making processes, budgets, operations, and the performance of governmental bodies. Releasing such information should enable inward observability, to allow external stakeholders to monitor the internal operations of an organization (Cucciniello, Porumbescu, and Grimmelikhuijsen 2017). In public debates, transparency is widely considered a self-evidently good thing in most societies, to the extent that it has gained “quasi-religious” status (Hood 2006, p.9). According to O’Neill, transparency “is supposed to discipline institutions and their office holders by making information about their performance more public.” Publicity is used to deter corruption and poor performance and to secure a basis for ensuring better and more trustworthy performance.” (O’Neill 2006, p. 13). The basic premise is that transparency fosters knowledge and understanding of what the government does, and that this knowledge and understanding eventually brings greater trust.

While a large body of work has shown how such “regular” transparency affects citizen trust in government organizations (Porumbescu, Meijer, and Grimmelikhuijsen 2022), many transparency policies in regulatory settings have a “targeted” nature. In other words, governments disclose information about regulated organizations rather than about themselves (Meijer and Homburg 2009). Regulators use targeted transparency as a tool to enforce compliance among the organizations they regulate. Targeted transparency policies, for instance, entail the disclosure of inspection reports about the quality and safety of healthcare, the safety of nuclear plants, or rule violations of consumer rights. By providing objective information about the compliance of regulated organizations, regulators inform citizens and reduce information asymmetry (Fung, Graham, and Weil 2007). The idea is that informed choices by consumers will stimulate organizations to make products that are safe and provide good value for money (Etzioni 2010, p. 392).

There is also an ideological underpinning for targeted transparency policies. In the aftermath of the 2008 credit and financial crisis, transparency was brought forward as a better alternative for stronger forms of regulation (Etzioni 2010, 2014), the latter of which supposedly would stifle economic progress and innovation. At the same time, this dichotomy might be misleading, since transparency must often be mandated, and its veracity must be checked and enforced. In this sense, it is not that different from other forms of government regulation (Etzioni 2010). Additionally, the effectiveness of transparency as a regulatory instrument has been the subject of empirical investigation. For instance, the effectiveness of publicly disclosing the company names of non-compliant regulations depends on

several different aspects, such as the responsiveness and type of supervised entity, and the nature of the violated norm (Meijer and Homburg 2009; van Erp 2010, 2011).

Altogether, the literature emphasizes transparency as a relatively new form of regulation, but slightly different from traditional methods, as its effectiveness is strongly contingent and relies more heavily on the public to process information. Some argue that targeted transparency is a “weak” or “light” form of regulation and has a political purpose. In the next section, we highlight how targeted transparency as a form of regulation relates to the broader debate on the relationship between regulation and trust.

Citizen Trust and Regulation: Two Contrasting Perspectives

As argued in the introduction, citizen trust plays a key role in regulation. First, we explain how trust is defined using an interdisciplinary approach. Next, we discuss how targeted transparency affects citizens’ trust levels.

Trust has been studied widely across all disciplines of the social sciences. In this article, we employ a broad interdisciplinary and widely cited definition of trust by Mayer, Davis, and Schoorman (1995) and then explain how this fits with our focus on citizen trust in regulatory agencies. Mayer et al. define trust as follows: “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, Davis, and Schoorman 1995, 712).

When we apply this definition to the regulatory context, two elements stand out: “vulnerability” and “expectations” of the trusted party. First, vulnerability is inherent to the relationship between citizens and regulatory agencies (Six 2013). For instance, citizens cannot assess the quality of schools or the safety of nuclear power plants. Instead, citizens depend on regulatory agencies to inspect and enforce rules correctly in order to ensure quality and/or safety. If an agency makes a mistake, an elderly person in a nursing home or a resident near a nuclear power plant is vulnerable to certain risks. Hence, a relationship that entails citizens’ trust in a regulatory agency involves an element of vulnerability.

Second, the expectations of the vulnerable party (i.e., the citizens) are central to trust. These expectations are based on the perceptions that people have of the “other.” In other words, are the intentions and behaviors of a regulatory agency perceived as trustworthy? Various literature reviews have shown that perceived trustworthiness is best conceptualized in multiple dimensions. These three dimensions are central: perceived competence, benevolence, and integrity (Mayer, Davis, and Schoorman 1995; McEvily and Tortoriello 2011; McKnight, Choudhury, and Kacmar 2002). Perceived competence is the extent to which a citizen perceives the regulatory agency to be capable, effective, skillful, and professional; perceived benevolence refers to the extent to which a citizen perceives the regulatory agency to care about the welfare of the public and to be motivated to act in the public interest; and perceived integrity is whether citizens perceive the regulatory agency as sincere, truthful, and fulfill its promises.

Such assessments of trustworthiness cannot be made with full certainty. First, due to an insolvable asymmetry, citizens

cannot build on extant empirical research, we draw from studies on different but related topics. First, the literature on compliance shows that regulatee trust in a regulator has a positive effect on rule compliance (Braithwaite and Makkai 1994; Murphy 2004). Arguably, increased compliance by regulated organizations has a positive effect on citizens' trust in these organizations.

The second strand of research focuses on the role of source credibility. Hovland and Weiss (1951) showed that information from a credible source is considered more trustworthy than the same information from a less credible source. For instance, the literature on risk communication shows that the source of information is important for people who look for trustworthy information about food safety (Frewer et al. 2003). An experimental study by James and Van Ryzin (2017) showed that, regarding performance information, respondents had more trust when it was published by an independent source, such as a regulator, compared to a publication by a non-independent source (James and Van Ryzin 2017, p. 32).

In short, information from a credible source is trusted more easily and the independence of the information source is a factor contributing to such credibility. When we apply this to the domain of regulation, we expect that higher levels of citizen trust in the regulator (the information source) will increase the trustworthiness of the information disclosed to the public, and in turn, strengthen the effect of targeted transparency on citizen trust in the regulated sector (H1b).

H1b) Increased citizen trust in the regulatory agency strengthens (moderates) the effect of targeted transparency and citizen trust in the regulated sector.

Framing Targeted Transparency

So far, we have discussed targeted transparency as a form of mandatory disclosure of information by private or public institutions with regulatory intent (Weil et al. 2006), which is in line with common definitions of government transparency (Cucciniello et al. 2017). Simultaneously, scholars have repeatedly emphasized that targeted transparency is more than simply providing information to consumers, residents, patients, or parents (Fung et al. 2007, p.90; Meijer and Homburg 2009). Indeed, proactive tailoring and framing of information has become increasingly important, and various studies have found that regulatory agencies actively align their communicative efforts with the various audiences they serve (Gilad, Maor, and Bloom 2015; Maor, Gilad, and Bloom 2013). For instance, Müller and Braun (2021) found that the European Central Bank actively aligns information about their regulatory efforts using frames that fit their internal and external audiences. By strategically managing information, regulators hope to build a strong reputational history that could protect them from future threats (Salomonsen, Boye, and Boon 2021)

Given the importance of framing, we explicitly theorize and test four salient types of information frame that could shape such communicative efforts: equivalence framing, anecdotal framing, reference points, and information specificity. The choice for this set of frames was twofold. First, this set of frames has been empirically tested, and these frames have been identified as important, specifically in the setting

of public management and administration (see James et al. 2020). At the same time, these frames have not been applied to targeted transparency nor have they been linked to citizen trust in regulation.

Second, these frames closely reflect the various ways in which target transparency can be shaped in practice. For instance, regulators implicitly use negative equivalence framing when they publicly “name and shame” offenders (Van Erp 2011). In addition, in many countries, regulators publish rankings and reference points about regulated organizations, such as school performance and hospital compliance of hospitals (e.g., Meijer 2007). How such information is presented requires careful attention; regulatory information needs to be understood and accessible for it to be useful to citizens (Fung et al. 2007). Therefore, it is important to develop a more sophisticated understanding of targeted transparency by developing hypotheses for each of these four information frames.

First, equivalent framing affects citizens' perceptions. For instance, two logically equivalent figures expressed with different values will lead to different assessments by individuals (Rabin 1998). An experiment by Olsen (2015) showed that a hospital with a portrayed satisfaction rate of 90 percent received higher satisfaction ratings of around 20 percentage points compared to a hospital with a portrayed dissatisfaction rate of 10 percent. Providing negative information about supervised organizations is a common regulatory instrument of regulators, the so-called naming and shaming (Van Erp 2011), and is highly relevant in the regulatory context. In line with these previous studies, we formulated the following hypothesis:

H2) Targeted transparency that includes a negative equivalence frame has a negative effect on citizen trust in the regulated sector, compared with a positive equivalence frame.

A second insight is the type of information disclosed. While most published performance information is quantitative (Van de Walle and Roberts 2008), performance can also be expressed qualitatively (Meijer and Homburg 2009). For example, quantitative information can show the percentage of norm violators in a certain sector. Qualitative performance information can reveal descriptions or complaints about norm violations in a sector. We expect that, while quantitative (statistical) information is often seen as more reliable, qualitative information will eventually have a stronger impact on citizen perceptions.

Qualitative information tends to be more vivid and memorable than statistical information (Petersen and Aarøe 2013). In particular, detailed personal accounts can cause stronger emotional commitment than statistics (Slovic 2007). These informational properties affect the assessment of information is assessed (Nisbett and Ross 1980). Olsen (2017b) applied these insights in an experiment in a public sector setting and found that anecdotal information (e.g., a vivid qualitative account of hospital performance) was more easily recalled and had a larger impact on performance assessment than statistical data on hospital performance. Here, we hypothesize that negative anecdotal information hurts citizen trust compared with negative statistical information. Here, we focus on negative information because negative events is more visible in

terms of specificity and is usually more widely reported in news media (White and Eiser 2005)

H3) Targeted transparency that includes negative anecdotal information has a negative effect on citizen trust in the regulated sector, compared with statistical information.

Our next hypothesis explicitly focuses on the use of performance benchmarks, a common practice in the regulatory sector (Meijer and Homburg 2009; Van Erp 2011). Psychological research shows that, when people do not possess deep knowledge of a certain topic, they tend to rely on reference points to assess this number (Musweiler 2003). This can be any reference point that compares one number with another. For instance, is the performance of School X higher or lower than the average in a certain area? How did norm violations in sector X compare to norm violations over the last year?

Previous studies have shown that reference points affect how a given numerical performance is assessed (Charbonneau and Van Ryzin 2015). In an experiment, Olsen (2017b) asked participants to provide their satisfaction ratings for a specific school. A random group of participants was shown a social reference point that compared the performance of School X with that of other schools. The second group of participants in the experiment showed the performance of School X relative to earlier years (a historical reference point). In both cases, the reference point affected participants' satisfaction ratings, yet the social reference point had a much stronger impact than the historical reference points. A final takeaway from this study is the existence of negativity bias. A negative comparison to a reference point—school X performs worse than others or earlier years—had a stronger effect than a positive comparison to a reference point. Assuming this stronger effect for a negative comparison, we formulate only a negative comparison in our hypothesis:

H4) Targeted transparency that includes social reference points have a negative impact on citizen trust in the regulated sector, compared with historical reference points.

Our next and final hypothesis distinguishes between the specificity of regulatory information. This topic has hardly been investigated in the performance information literature. However, this is a relevant distinction, as regulatory agencies may publish data that reflect the performance of individual schools, hospitals, market organizations, etc., while at the same time compiling and publishing data on the performance of a sector as a whole. For example, a market regulator that specifically names a company for violating several rules is an example of specific information, whereas a market regulator that publishes an inventory of the same rule violations for all companies in a sector is an example of generic information.

While information specificity has not been investigated in the public sector context, research on human judgment has shown that providing more abstract information about course evaluations hardly affects the behavior of students' course evaluations, whereas providing specific information does (Borgida and Nisbett 1977). In addition, specific feedback information is more likely to lead to positive changes in behavior (Feys, Anseel, and Wille 2011). White and Eiser (2005) tested the extent to which information specificity

affects trust in the management of hazardous risks in nuclear plants. Information about specific events, either positive or negative, has a stronger impact on trust than information about generic policies. Therefore, we postulate the following hypothesis.

H5) Targeted transparency that includes specific information has a negative effect on citizen trust in the regulated sector, compared with abstract regulatory transparency.

We tested these hypotheses using three regulated domains. Every regulator and regulatory domain differs in terms of its structure, capacity, and regulatory duties. To assess the robustness and generalizability of the hypothesized relationships, we employed a strategy of maximum variation sampling (Bryman 2016). This means that we intentionally varied the regulators and domains. This study focused on healthcare safety, consumer rights, and nuclear safety.

For healthcare, the main regulator in the Netherlands is the Inspectorate of Healthcare and Youth (IGJ). This regulator is relatively well known by the public, as it regularly features news items. The healthcare sector is a mixture of publicly funded (e.g., hospitals, elderly care) and privately funded (e.g., dentists, private health clinics) organizations and has a range of capacities to regulate these domains, such as formal warnings, forced closure, and fines.

The main consumer rights regulator is the Authority of Consumer and Markets (ACM). The ACM is a typical market regulator that can potentially regulate all private markets in the Netherlands concerning fair market competition and consumer rights. Markets can be highly diverse, but ACM tends to focus on energy and the digital economy such as online retailers. Their regulatory instruments range from explanatory communication with regulations to fines of up to 10% of a company's annual revenue.

Finally, the Authority for Nuclear Safety and Radiation Protection (ANVS) regulated nuclear installations in the Netherlands and was only established as late as 2017. One of the most well-known nuclear installations in the Netherlands is the nuclear power plant in Borssele, which is the only nuclear plant in operation in this country. The ANVS issues permit nuclear installations and ensure enforcement of safety standards. If the rules are violated, the regulator can impose a fine or close facility.

As previously highlighted, these three domains have very different regulatory regimes in terms of their organizational structure, governance, procedures, functioning, regulatory duties, and accountability arrangements (cf. May 2007). Although there are undoubtedly differences in the overall level of transparency and trust in regulatory agencies in these domains, there are no theoretical reasons to assume a priori that the effect of transparency on citizen trust is systematically different in these three regulatory domains. Nevertheless, we test the hypotheses generically (across the domains) and specifically (within the domains).

Research Design

The experiment consisted of several successive steps (See figure 1). First, participants provided informed consent, filled out the attention check, and answered a question measuring

[headline with manipulation]
90 percent of online shops correctly inform customers about their rights

[body text with manipulation]

A recent investigation from the Authority for Consumers and Markets (ACM) shows that 90 percent of all online stores in the Netherlands correctly inform their customers of their rights as consumers.

[context of regulatory issue, same for all participants]

Other results show that there are still issues concerning the return of defective products and deferral. Over the past few months, the ACM has investigated whether online shops follow rules and regulations when it comes to returning goods and the cancellation of orders.

[generic information about the regulatory agency, same for all participants]

The ACM is an independent regulatory agency and is tasked with safeguarding consumer rights. The aim is to create a level playing field with companies that adhere to the rules as well as inform consumers to stand up for their rights. The ACM can enforce rules and regulations if companies do not comply.

Figure 2: Example: Generic Positive-equivalence Frame. Translated to English.

Table 1: Experimental Conditions

	Experimental Condition	Operationalization (translated)
Control	Non-transparency	Regulatory agency X will not disclose their findings, because...
	Neutral condition	No information about transparency, only generic information about regulatory agencies.
Generic	Positive equivalence	90% of sector organizations adhere to the professional norm
	Negative equivalence	10% of sector organizations do not adhere to the professional norm
	Anecdotal framing	Clients in sector X feel they have not been treated correctly and file a complaint with the regulatory agency.
	Social framing	90% of sector organizations adhere to the professional norm, which is lower compared to the similar sector Y.
Specific	Historical framing	90% of organizations adhere to the professional norm, which is lower than last year.
	Positive equivalence	Organization X adheres to the norm in 90% of the audits.
	Negative equivalence	Organization X does not adhere to the norm in 10% of the audits.
	Anecdotal framing	Because person X feels he/she has been mistreated by organization Y, person X files a complaint with the regulatory agency.
	Social framing	Organization X adheres to the norm in 90% of audits, which is lower compared to other organizations.
	Historical framing	Organization X adheres to the norm in 90% of audits, which is lower than last year.

A challenge in designing the trust measures for this study is that while we tried to stay close to the CTGO item wording, this did not make sense for all items. The CTGO was developed for (government) organizations, so we had to adapt it in the following ways:

- Instead of citizens, the trust in sector scale reads “customers.”
- For the benevolence item the original wording concerned “acting in the interest of citizens.” A close translation to sectors (‘acting in the interests of consumers’) may not make sense to respondents. Therefore, this item was changed to [Organizations in sector X] will not deceive their customers.
- A third important adaptation was the inclusion of an additional item for competence. The original language

(“carries out its duties very well”) does not fit a sector as a whole, and we split competence into two elements that are crucial in regulation: compliance with rules and the *ability* to comply with new rules and regulations. This is an important distinction in classic Responsive Regulation Theory, which posits that regulatory responses should be tailored to the type of noncompliance (Ayes and Braithwaite 1992). For instance, unable non-compliers should be informed so they are able to comply, able, but willingly, non-compliers should be met with more stringent responses, such as fines. By including these additional items, we were better able to capture this relevant distinction in the regulatory context.

Across regulatory agencies and their sectors, the scale had a Cronbach’s alpha of 0.872, which is good. As we used three

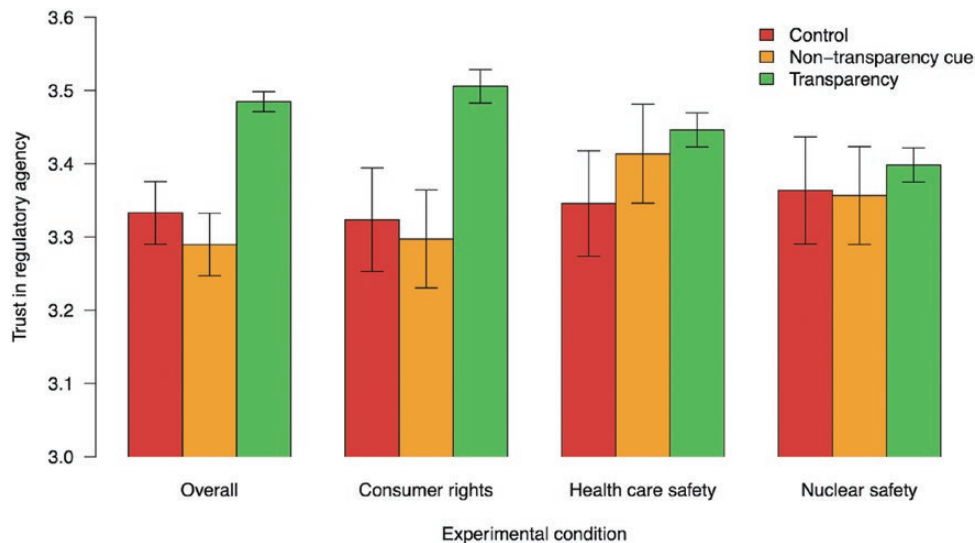


Figure 3: Group Means (95% confidence intervals) of Trust (scale 1–5) in Regulatory Agencies by Experimental Manipulation. Note: Axis cut (3.0–3.6) to allow for better comparison.

different cases with regulatory agencies in the experiment, with different sectors, we also checked the internal consistency of the CTGO measure for each of the regulators and the respective sectors using the same criteria. The reliability of all measures was well above 0.7, which is satisfactory (Supplementary Appendices A and B). Based on this, all items of the trust CTGO measure were retained in the analysis, resulting in three items for trust in regulators and four for trust in sectors.

Finally, for balance checks, we asked participants for their gender, political left/right self-placement, pre-test and post-test knowledge, year of birth, and highest educational level achieved (see Supplementary Appendix C).

Results

The descriptive analysis and a correlation table can be found in Supplementary Appendices C and D. All analyses were corrected for multiple testing using Bonferroni correction for six hypotheses ($p = .05/6 = 0.0083$). Before testing our hypotheses, we gauged whether the respondents learned about the specific regulator in each scenario. The pre-experimental self-assessed knowledge of the participants was 2.54 (SD = .83) (on a scale from 1 to 5). After the experiment, respondents were asked to again assess their own knowledge about specific regulators, which increased to 2.97 (SD = .74), which is a statistically significant increase ($t = 45.44, p = .001$). So indeed, by presenting a short scenario about a regulator, participants learned about the regulators and their respective sectors. This indicates that the respondents were somewhat attentive to our experimental treatments.

H1a) Targeted transparency—in general—has a direct positive effect on citizen trust in a regulatory agency.

We carried out a variance analysis (ANOVA) to test this hypothesis (Levene's $p = .272$). The results show that the mean trust in regulatory agencies is 3.33 (SD = .69) for the control condition, $M = 3.29$ (SD = .69) in the explicit non-transparency condition and $M = 3.48$ (SD = .69) in the

transparency condition $F(2, 12040) = 53.02, p < .001, \eta^2 = 0.001$. The transparency condition differed statistically significantly from the control and non-transparency conditions at $p < .001$ (see figure 3). Control and non-transparency cues were not statistically different.

Figure 3 visualizes this effect for citizen trust in the regulatory agency for the control, non-transparency cue, and transparency groups. Overall, this confirms that transparency has a positive effect on trust in regulatory agencies, which supports Hypothesis 5a. The figure also highlights that the regulatory agency concerned primarily with consumer rights (Authority Consumer and Markets) most strongly drives the effect of transparency on trust in regulatory agencies, while the differences between the control, non-transparency, and transparency groups are smaller for the other two agencies.

H1b) Increased citizen trust in the regulatory agency strengthens (moderates) the effect of targeted transparency and citizen trust in the regulated sector.

To test Hypothesis 1b, we use OLS regression and build the model in steps. The differences between the experimental conditions were small for the direct effect of experimental intervention and trust in the sector (table 2, Model 1). Adding trust in regulators (agency) as a predictor showed a strong positive and statistically significant effect on trust in the sector (Model 2). In the next step (Model 3), we tested the hypothesis by adding an interaction effect. Here, too, trust in the regulatory agency is statistically significant. However, there was no interaction between transparency and trust in regulators.

Based on this, we reject Hypothesis 1b, meaning that there is no moderating effect of trust in a regulator on the relationship between transparency and trust in the sector in our data. Rather, trust in the regulator directly affected trust in the sector ($B = 0.46, p < .001$).

H2) Targeted transparency that includes a negative equivalence frame has a negative effect on citizen trust in the regulated sector, compared with a positive equivalence frame.

Table 2: OLS Regression of Targeted Transparency on Trust in the Sector

Trust in Sector					
Variables	Estimate	SE	95% CI		p
			LL	UL	
Model I: Experiment (control = ref)					
Intercept	3.25	0.02	3.21	3.29	.000
Non-transparency cue	-0.01	0.03	-0.07	0.05	.657
Transparency	0.03	0.02	-0.00	0.08	.111
$F = 2.287, p = .000, df = 12040, r^2 \text{ adj.} = 0.005, d.w.=1.86, \text{VIF near } 1.0$					
Model II: Trust in agency added					
Intercept	1.71	0.03	1.65	1.78	.000
Non-transparency cue	0.00	0.02	-0.04	0.06	.816
Transparency	-0.03	0.02	-0.07	0.00	.09
Trust in agency	0.46	0.00	0.45	0.48	.000
$F = 1112, p = .000, df = 12039, r^2 \text{ adj.} = 0.22, d.w.=1.86, \text{VIF near } 1.0$					
Model III: Trust interaction					
Intercept	3.31	0.19	3.27	3.35	.000
Non-transparency cue	0.00	0.02	-0.05	0.06	.847
Transparency	-0.03	0.02	-0.07	0.00	.096
Trust in agency	0.46	0.03	0.41	0.52	.000
Non-transparency \times trust in agency	-0.00	0.04	-0.08	0.07	.855
Transparency \times trust in agency	-0.00	0.03	-0.06	0.05	.882
$F = 667.1, df = 12037, p = .000, r^2 \text{ adj.} = 0.22, d.w.=1.85, \text{VIF near } 1.0$					

We find support for this hypothesis, $t(4002.4) = -4.03, p < .001$. On average, a positive transparency frame leads to higher trust in the regulated sector ($M = 3.34, SD = .67$) than a negative framing ($M = 3.25, SD = .70$) (see figure 4, upper left). The effect size is Cohens $d = 0.13$, which is a small effect. Focusing on the different agencies and sectors in our sample, it seems that, especially for consumer rights, positive framing is strongly associated with greater citizen trust.

H3) Targeted transparency that includes negative anecdotal information has a negative effect on citizen trust in the regulated sector, compared with statistical information.

Our third hypothesis predicted that negative anecdotal framing would lead to less trust in a regulated sector. Surprisingly, a t -test showed that negative anecdotal framing ($M = 3.31, SD = .68$) had a positive effect on trust in a regulated sector, compared to negative statistical framing ($M = 3.24, SD = .71, t(4010.3) = 2.89, p = .003$). (See figure 4). The effect size was $d = 0.09$, which corresponded to a small effect. Thus, we rejected this hypothesis. Again, the effect of anecdotal information on trust in a regulated sector stems primarily from the consumer-rights sector.

H4) Targeted transparency that includes social reference points have a negative impact on citizen trust in the regulated sector, compared with historical reference points.

Hypothesis 3 postulated that social reference points have a stronger (negative) effect on trust than historical reference points do. We found no support for this hypothesis. The effect of social framing on trust in the regulated sector ($M = 3.30,$

$SD = .70$) did not differ significantly from that of historical framing ($M = 3.26, SD = .70, t(4002) = -1.60, p = .109$). See figure 4, lower left panel). When taking a closer look at regulators and their sectors, we see that social information is associated with more trust in the regulated sector in the case of consumer rights. Historical information is associated with higher levels of trust in the healthcare and nuclear safety sectors.

H5) Targeted transparency that includes specific information has a negative effect on citizen trust in the regulated sector, compared with abstract regulatory transparency.

A t -test reveals that specific regulatory transparency does not have a stronger negative effect on trust in the regulated sector ($t(10026) = -1.705, p = .08$), with means for specific transparency ($M = 3.30, SD = .68$), which is very similar to that of abstract transparency ($M = 3.28, SD = .69$) (see figure 4, lower right pane). Specific information is associated with greater trust in consumer rights and nuclear safety. There were no statistically significant effects for either the regulators or their respective sectors.

Table 3 summarizes the outcomes of the analysis and highlights the most important contextual differences between regulators and sectors.

Discussion and Conclusion

In this discussion, we will summarize the key findings, present findings in the context of current insights, and highlight the limitations and implications for the debate on regulation and trust.

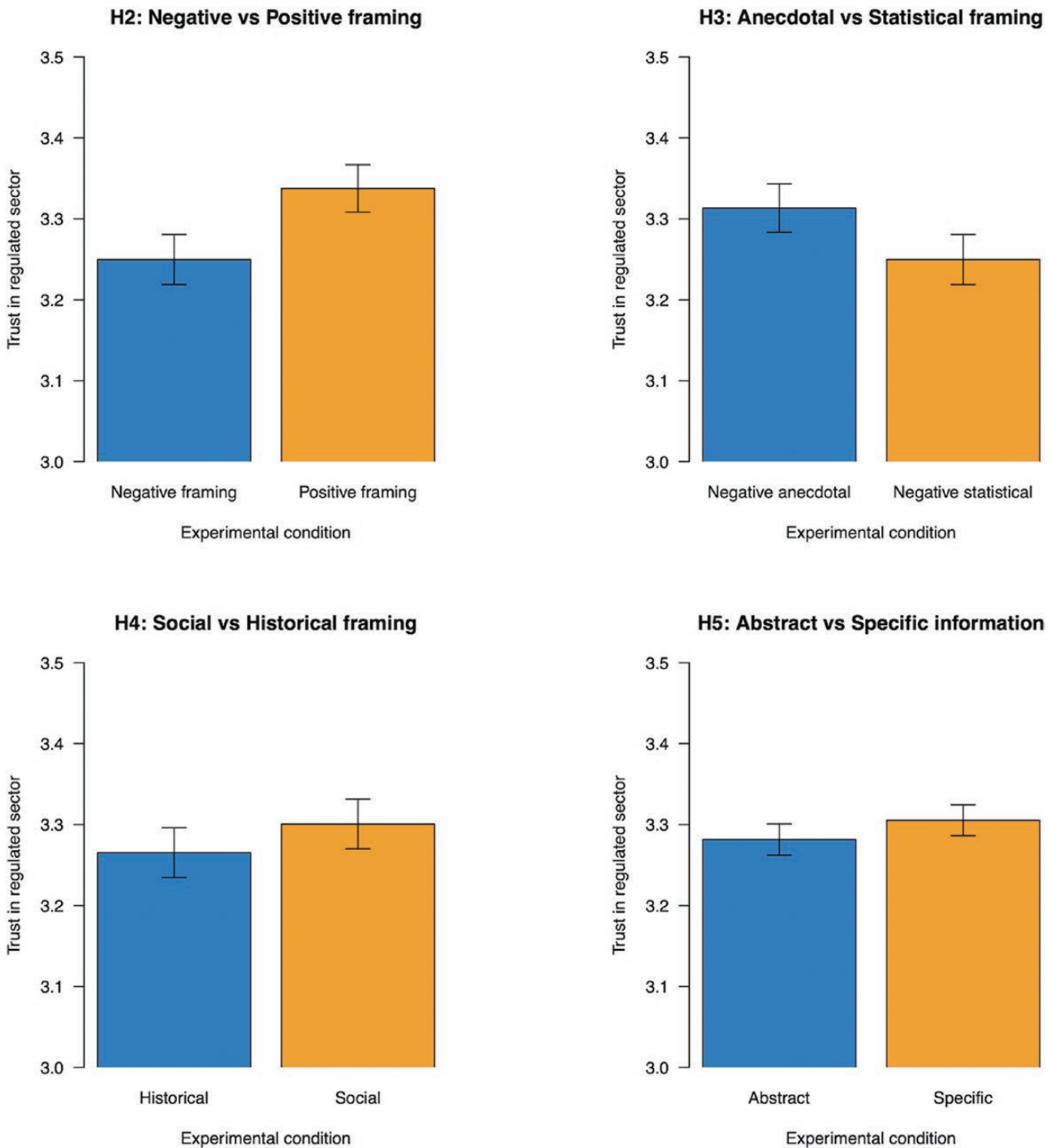


Figure 4: Group Means (95% confidence intervals) of Trust (scale 1–5) in the Sector by Experimental Manipulation. Upper: H1 (left), H2, (right). Lower: H3 (left), H4 (right). Note: Y-Axes cut for comparison.

Our findings are some of the first to shed light on how targeted transparency affects citizen trust in regulated sectors, and how this interacts with trust in regulators. First, we find mixed evidence that targeted transparency affects trust in the regulated sectors. We found that some frames, such as positive equivalence framing and anecdotal frames, had a positive impact on citizen trust. No difference in trust in the sector was found for social versus historical benchmarks or abstract versus specific information. Second, an auxiliary finding concerns the contextual nature of some of the relationships

found. Although generic patterns persisted, we also found a divergence—more negative pattern in the nuclear safety domain.

First, our study supports recent findings on government transparency and trust. A recent meta-analysis of 49 studies confirmed that, overall, there is a positive relationship between transparency and trust, but that there are contextual conditions that moderate this (Wang and Guan 2022). This is in line with our findings and with recent experimental findings that transparency in regulatory contexts generally

Table 3 : Overview of Results

Hypothesis	Conclusion	Contextual Differences per Sector
H1a) Direct positive effect on citizen trust in a regulatory agency.	Supported	The effect of transparency on trust in the agency is the strongest for consumer rights, and less for health care. The pattern diverges for nuclear safety.
H1b) Moderation effect of trust in the regulatory agency	Rejected	No moderation. Similar patterns for the sectors.
H2) Negative vs positive equivalence frames	Supported	Positive equivalence frames create more citizen trust in the consumer rights domain. In nuclear safety and health care safety, the effect is nonexistent.
H3) Anecdotal vs statistical information	Rejected	The effect of anecdotal information on trust in a regulated sector stems primarily from the consumer rights sector. For health care safety and nuclear safety, there is no effect.
H4) Social vs. historical reference points	Rejected	Small variations between the sectors. No significant effects.
H5) Specific vs abstract information	Rejected	Small variations between the sectors. No significant effects.

has a positive effect on citizen trust and support (Beyers and Arras 2021; Grimmelikhuijsen et al. 2021; Maman et al. 2022). At the same time, our study indicates that we should not be overly optimistic: we found a combination of null results and small positive effects. However, studies in other areas of government found negative or null effects (e.g., De Fine Licht et al. 2011; Grimmelikhuijsen, Piotrowski and Van Ryzin 2021), we find that in the regulatory context, transparency has a more pronounced positive effect on citizen trust in regulated sectors.

Second, these findings allude to the literature on performance information framing. While our study did not have the primary intent of studying the effects of performance information, our findings do speak to this literature. We found effects of equivalence and anecdotal frames on citizen trust but no effect of reference points on information specificity. This is remarkable, as some of these effects have been repeatedly found in the literature (e.g., Olsen 2017a, 2017b; Webeck and Nicholson-Crotty 2020). One explanation is that in this study, we measured the framing effects on trust, whereas most performance information experiments rely on measuring citizen satisfaction or performance ratings (James et al. 2020). Citizen trust is a complex and multidimensional construct, and in that sense, of a higher order than performance ratings. Performance ratings may be only a relatively single factor in determining trust and are therefore more likely to be affected by small changes in information framing. This indicates that the strength of information framing may be conditional on the type of attitude measured.

What implications do these findings have for a broader debate on regulation and trust? In classic texts, the regulatory state has always been connected to trust deficits and mistrust among social actors (Moran 2002; Power 1997). However, instead of a trade-off between regulation and trust, we find that targeted transparency, which highlights the active regulatory supervision of a sector by a regulator, may help instill public trust (e.g., Six 2013). This resonates with recent findings from Maman, Feldman and Levi-Faur (2022) who found that stronger state interventions led to higher trust in a specific FinTech firm. More broadly, the regulatory state may be part of what Mettler (2011) has coined the “submerged state”: many government policies are implemented in a way that is hidden from the public, for instance, through grants or tax breaks. This makes it difficult for citizens to understand and evaluate the impact of government on their lives. As such,

citizens are generally unaware of many state interventions they indirectly benefit from and, as a result, do not give government credit, or blame, for it (Guardino and Mettler 2020). Likewise, regulators and their impact on the daily lives of citizens is rather unknown and invisible to people. Making this important work visible may in help regulators to get credit (or blame) where this is due (Gilad et al. 2015). This perspective on regulatory oversight and trust opens up new avenues for empirical research on how information on regulatory oversight as part of a “submerged state” affects citizen trust in regulation.

Finally, a point for further debate is that while we find contextual differences, our experimental design does not provide ready explanations for these differences. The positive effect of transparency on citizen trust seems mainly driven by the market regulator, while in nuclear safety, the effect is absent, and the patterns even point to a potential negative relation. There are various explanations for this discrepancy. For instance, the Dutch nuclear authority was founded in 2017 only and is much less known than other regulatory agencies, which may make them more vulnerable to negative public perceptions. This is in line with a media content analysis by Salomonsen et al. (2021), who found that agencies with historically positive reputations receive more positive news coverage, which may strengthen trust. Besides differences in agency reputation, there may be differences in the nature of the regulated sector. The nuclear sector is much less tangible and inhibits much greater risk if things go wrong than a market sector, such as e-commerce. This assumption is in line with a study on risk communication by White and Eiser (2005), who found that negative events in nuclear safety had a stronger negative effect on trust than events in the pharmaceutical industry. This calls for future research to systematically compare the role of risk as a contextual factor shaping trust in regulated sectors.

Next, we discuss the limitations of our study. First, while we did not find a moderated relationship between transparency and trust in regulated sectors, there is possibly a mediated relationship in which the effect of targeted transparency increases trust in an agency, which, in turn, increases trust in a sector (see Supplementary Appendix G for an exploratory post-hoc analysis). Perhaps, citizens use the trustworthiness of regulatory agencies to assess whether a sector can be trusted. Simultaneously, a reversed causal relationship may also be possible. For instance, citizens with a great deal of

trust in nuclear power plant safety may believe that because plants are safe, the nuclear regulatory agency must be doing things right. To empirically determine the causally mediated relationship between both types of trust, more sophisticated experimental designs are needed. Follow-up research may seek to disentangle (a) the direction and (b) the strength of these relationships using specific experimental designs to test for causal mediation (e.g., Imai et al. 2011).

Second, a more generic limitation concerns the survey experimental method we employed. Survey experiments have been criticized for their lack of external validity. Although survey experimental effects have been found to replicate in the real world (Barabas and Jerit 2010), survey experimental treatments are often presented in a “clean” survey environment, and the effects may not be as strong as they occur in the real world (Gaines, Kuklinski, and Quirk 2007). While underscoring this criticism, it is important to first establish the potential effects of transparency with the high internal validity of a survey experiment before looking at the potential of more realistic field experiments (Bouwman and Grimmelikhuijsen 2016). To test the real-life effect of transparency, regulatory scholars should collaborate with regulatory agencies to conduct field experimental tests in which real or mock messages are tested, changed, and retested (Hansen and Tummers 2020).

Third, we shortened the validated CTGO measurement to reduce respondent fatigue (Grimmelikhuijsen and Knies 2017). This approach has two limitations. First, shortening validated measurement scales sometimes lowers test-retest reliability (Krueger 2012). Second, this precludes performing a subgroup analysis based on the subdimensions of competence, benevolence, and integrity. As we were not primarily interested in the dimensions of trust, but rather in the concept of trust as a whole, this approach strikes a balance between the use of validated items and scale length. In our case, factor analysis showed high reliability and factor loadings for the trust concept. Further research could focus on how transparency affects each dimension of trust in the context of regulatory agencies.

A related avenue for future research concerns the measure of trust in these sectors. One key challenge for this study was to develop a measure that was comparable to the “trust in agencies” measure, but also fitted with a different object of trust (trust in an abstract group of organizations). To ensure construct validity, we stayed relatively close to the validated CTGO scale by Grimmelikhuijsen and Knies (2017), while making some important adaptations to the scale. Still, we acknowledge that it might be harder for people to assess a rather abstract and relatively unknown group of organizations in a sector compared with a specific (government) organization. That said, it is quite common in public administration scholarship to measure trust in objects of trust that are vague abstractions to most people, such as trust in politics, institutions, or government. Trust in a sector might not be all that more abstract and may even be more concrete than these types of trust. Nevertheless, future research that refines and strengthens the measurement of trust in sectors is welcome.

In conclusion, this study examined whether targeted transparency affects citizens’ trust in regulated sectors. We found that transparency generally has a positive effect on trust in sectors but in a different way than we anticipated. Targeted

transparency illuminates the active role of regulatory agencies in supervising particular domains and this instills some public trust depending on sector and transparency frame. So, are regulatory agencies be “guardians of trust” as suggested by some? Our conclusions provide both supports and nuances this idea: regulatory agencies might be considered as *modest* guardians of trust.

Supplementary Material

Supplementary data is available at the *Journal of Public Administration Research and Theory* online.

Conflict of Interest

Robin Bouwman and Stephan Grimmelikhuijsen declare no conflict of interest. Femke de Vries holds a part-time position as chair of the Advisory Council of the Dutch Authority Nuclear Safety and Radiation Protection (ANVS).

Data Availability

The data underlying this article are available in Harvard Dataverse at <https://doi.org/10.7910/DVN/3DTJA5>.

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