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Article

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Abstract

Declining citizen trust in government is an important driver for NPM-style reforms. Increasing people's knowledge by providing factual knowledge about government performance outcomes is seen as an important way of increasing citizen trust in government. Does this promise hold or is knowledge about performance outcomes not that important? Two rivalling hypotheses are being investigated. One proposition postulates a link between knowledge and trust, whereas the alternative hypothesis borrows from social-psychological research arguing that subconscious and affective cues are more important. In order to investigate this question, this article presents the results of an experiment ($N = 658$) investigating the effect of performance outcome transparency on citizen trust in a specific government organization. Four groups visited different websites with varying degrees of transparency and performance outcome. The results demonstrate that the link between transparency and trust in a government organization is determined by a mix of knowledge and feelings. Further, the overall effect of transparency is limited. Pre-existing and fundamental ideas about what government does and whether it is benign or not are far more determining than a single experience with a government organization. This article concludes that knowledge about performance outcomes is only part of the link between transparency and trust, and that more realistic views about transparency's effects should be developed.

Points for practitioners

Transparency is generally hailed by many as the key to trust in government. This study shows that the magnitude of transparency on citizens' trust in government is often exaggerated as most people have pre-existing, fundamental beliefs about government which are only marginally influenced by transparency. However, transparency can contribute to maintaining existing trust levels through a mix of people's cognition and feeling about government. Transparency is necessary, yet professionals in public

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management and administration should develop realistic expectations about what transparency can really achieve for trust in government.

Keywords
accountability, public sector reform, transparency, trust

1. NPM and the rise of performance outcome transparency

Declining citizen trust in government, be it real or perceived, is argued to be a main driver ushering in New Public Management reforms (McNabb, 2009; Van de Walle, 2011). An important goal of these reforms is to foster transparency of performance outcomes in order to strengthen citizen trust (Kjaer, 2004; Pina et al., 2007; Pollitt and Bouckaert, 2004). According to Van de Walle and Roberts (2008: 211), 'we live in an age of quantified performance'. Transparency and quantified performance measurement are two NPM-components that seem to be a 'match made in heaven'. Quantified performance indicators are easily stored in databases and disclosed to a broad public, who can now use this information relatively cheaply and conveniently because of its availability on the World Wide Web (Snellen, 1998). Huge sets of performance data can now be published online in real-time and in comprehensible formats (Meijer, 2007). Hence, the Internet has potential to provide citizens with transparent government performance information.

Does transparency of performance information really contribute to citizen trust in government? In the debate on transparency and trust, 'transparency optimists' emphasize that transparency stimulates a 'culture of openness' within organizations, which is thought to have a positive effect on trust (Hood, 2006: 217). Moreover, according to transparency proponents, lifting the veil of secrecy will be beneficial to all of us and only those who have something to hide will oppose transparency (see, for example, Florini, 1998). Further, transparency helps people to become more familiar with government, brings them closer together and creates understanding (Nye et al., 1997). This is based on the idea that when citizens do not know what government is or does, they will not come to trust it. Therefore, several authors argue that one cause for a lack of trust in government is that citizens are not often enough provided with factual documentation about government processes and performance (Blendon et al., 1997; Bok, 1997; Cook et al., 2010). Regular disclosure of government performance information is crucial to increasing citizen trust. In this article we will focus on citizens' knowledge of the performance of a government organization, as opposed to knowledge about its processes and policies.

The central assumption behind this optimistic view on how trust can be furthered is that citizens will use performance information to make rational and conscious decisions. However, according to Etzioni (2010: 399) this is a weak spot in the optimists' argument. Optimists assume that the public reading the information

released by public officials will process it in the way in which it was intended and 'that their conclusions will lead them to reasonable action'. This assumption of rational information processing and decision-making is often criticized (Stone, 2002). Even simple information can be difficult for people to process, due to cognitive restrictions and biases (Etzioni, 2010: 399–400). Advocates of the concept of 'bounded rationality' argue that people in normal life are rational only to a limited extent. This idea is emphasized by several classic works on (bounded) rationality in which it is primarily stressed that individuals and groups simplify decision-making problems because of the difficulty of considering all alternatives and information (Lindblom, 1959; March, 1978; Simon, 1957).

Overall, NPM-like reforms have placed increasing emphasis on transparency of government performance by disclosing outcome information about policies with an eye on increasing citizen trust in government (Pollitt and Bouckaert, 2004). Numerous countries have enacted laws that guide the appropriate provision of information (Relly and Sabharwal, 2009). However, critics challenge the assumption of the rationalism behind performance transparency. To test this assumption, two rivalling hypotheses will be tested. The first assumption tests the effect of knowledge on trust in a government organization. The rivalling hypothesis offers an alternative explanation, as it assumes that there is also a more emotionally driven and subconscious, direct effect of transparency on trust in a government organization. This brings out the following central question: *Does performance outcome transparency increase knowledge, and does this affect citizen trust in a government organization?*

Prior empirical research has consisted mainly of surveys carried out to investigate the relation between transparency and trust (e.g. Tolbert and Mossberger, 2006; Welch et al., 2005). However, this method is not always useful to determine causality, because (cross-sectional) survey research cannot separate cause and effect since there is only one point of measurement in time. Experiments are preeminently suitable to investigate causal effects (Bozeman and Scott, 1992). Therefore, this study uses a large-scale online experiment to assess the effect of performance outcome transparency on trust ($N = 658$). Four groups are distinguished, comparing low and high levels of performance outcome transparency. Before elaborating on further details of the method, we first need to create more clarity about the two core concepts in this article: performance outcome transparency and trust in government.

2. Defining and conceptualizing performance outcome transparency

In general, the level of transparency of an organization refers to how willing it is to allow citizens to monitor its performance and to participate in its policy processes. Most definitions of transparency recognize the extent to which an entity reveals relevant information about its own decision processes, procedures, functioning and performance (Gerring and Thacker, 2004; Welch et al., 2005).

As such, transparency typically incorporates multiple components, including the availability of information about the internal workings or performance of an organization. This enables individuals and groups outside of the organization to monitor activities and performance undertaken within the organization. This leads to the following definition: 'Transparency is the availability of information about an organization or actor which allows external actors to monitor the internal workings or performance of that organization or actor' (Grimmelikhuijsen and Welch, 2012).

In this article we focus on one specific form of transparency: pro-active disclosure of performance outcome information. Two important dimensions of performance outcome transparency are the comprehensibility and timeliness of the relevant information. One of the key contributions of the Internet revolution to this type of transparency is that outcome data can be published online in real-time. In addition, complex sets of data may be disclosed in simpler and more comprehensible formats on websites. Hence, instead of simply divulging *more* information, performance outcome transparency implies that information is also presented in a *comprehensible* and *timely* manner (e.g. Dawes, 2010; Heald, 2006; Larsson, 1998).

The importance of the comprehensibility of government information is emphasized by several scholars. Larsson (1998: 40–42) stresses that transparency embraces the simplicity and comprehensibility of the information made available. In addition, Drew and Nyerges (2004) state that the clarity of information is an important dimension of transparency. In an attempt to operationalize transparency, they argue that clarity is measured according to the extent to which the disclosed information can be understood quickly. Comprehensibility of information is important to performance outcome transparency. Unfavourable performance outcomes can be made 'pseudo transparent' by launching websites that contain information that is difficult to comprehend. Pseudo transparency refers to a situation in which government organizations appear to be transparent, for example by publishing a great deal of information. This, however, does not necessarily mean more transparency. The Internet makes it possible to disclose a great deal of information, potentially creating a flood of misinformation (O'Neill, 2002).

Information timeliness is a crucial element of performance outcome transparency. Heald (2006) argues that there is a distinction between 'real-time' and 'retrospective' transparency. Real-time transparency is characterized by continuous surveillance. This means that the 'transparency window' is always open and that the government organization can be rendered accountable continuously. However, real-time transparency requires substantial human and technical resources to gather and disclose the data immediately. Further, because there is no reporting lag, there is an increased risk of measurement failures or errors in disclosing the data. In addition, not all information is suitable for real-time display. For instance, performance of schools (e.g. number of graduations) can only be disclosed in a meaningful way by retrospective reporting (e.g. Meijer, 2007); it is impossible

and/or meaningless to disclose this kind of performance information about a school based on just one particular day.

The transparency window is only open at periodic intervals in cases of retrospective transparency. Retrospective transparency allows a government organization to carry out its policy without the involvement of others and to then release information or reports at a certain moment, for example on a yearly basis. An organization is able to prepare for this moment, and after that the reporting cycle repeats itself. Hence, there is a reporting lag inherent to retrospective transparency, whereas this lag is absent or very small with regard to continuous transparency. On the other hand, through regular reporting, retrospective transparency enables quality control and auditing. Further, if a government organization provides regular reports, outsiders are able to monitor its performance over time (Heald, 2006). Although retrospective versus real-time transparency is not equal to 'old' and 'recent' information per se, the aspect of timeliness is important in performance outcome transparency.

3. Defining and conceptualizing trust in government

Trust will first be defined in a general sense, followed by a discussion of how this relates to performance outcome transparency. 'Trust' is a multidisciplinary concept with a wide variety of definitions. Because of this, Rousseau et al. (1998) have formulated an overarching definition of trust. Confident expectations and a willingness to be vulnerable are critical components of all definitions (Luhmann, 1979; Mayer et al., 1995; Zucker, 1986). Based on these overarching elements, an influential definition by Rousseau et al. states that trust is 'a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another' (Rousseau et al., 1998: 395). This means that trust is viewed as the perceived trustworthiness of another. Perceived trustworthiness is acknowledged by many scholars to be multidimensional (e.g. McKnight et al., 2002; Mishra, 1996; Rousseau et al., 1998). In this article, three often-mentioned dimensions of perceived trustworthiness are distinguished: competence, benevolence and honesty.

First, many authors on trust find some form of *perceived competence* to be a part of trustworthiness (e.g. Hetherington, 1998; Peters et al., 1997). All authors refer to some kind of capability to act. In this article, this refers to whether people perceive a government organization to be capable, effective, skilful or professional in making decisions. Second, many scholars regard *perceived benevolence* to be a part of trustworthiness. This can be viewed as a more ethical dimension of trustworthiness as it particularly focuses on the intentions behind government action (Levi and Stoker, 2000; Mishra, 1996; Peters et al., 1997). For this study, this refers to whether people think that a government organization genuinely cares about citizens' interests. Third, many scholars identify the *perceived honesty* or integrity of the trustee. In this article, perceived honesty implies that the government organization is perceived to keep commitments and tell the truth (McKnight et al., 2002).

4. Hypothesizing the effect of knowledge on trust

This section explores the character of the effect of knowledge on trust. As described in the Introduction, in this article knowledge *about* the activities and policies of a government organization is distinguished from knowledge of its performance outcomes.

The basic idea behind the thesis that transparency leads to more knowledge, and that this positively affects trust, is based on a portrayal of a rational humankind. The social-psychological 'expected-utility model' (EU-model) postulates that sensible decision-making is based on a rational assessment of all options available. These must be weighed on their value and probability, and then one must choose the decision which maximizes one's expected gain (Tiemeijer, 2011: 28). This view assumes a rational and calculating individual, an assumption borrowed from economic rational choice theories (e.g. Blau, 1964).

Further, conceptual analyses of 'trust' by Lewis and Weigert (1985) and McAllister (1995) recognize that trust has a cognitive element, characterized by ratio. Cognitive trust arises from accumulated knowledge that allows one to make relatively confident predictions regarding the likelihood that the object of trust is indeed trustworthy (Lewis and Weigert, 1985: 970). Knowledge provides 'good reasons' needed for the basis for cognition-based trust decisions (Lewis and Weigert, 1985; McAllister, 1995). The cognitive aspect of trust in this article refers to one's knowledge of the performance of a government organization. This kind of cognition-based trust works as follows: as knowledge of performance outcomes increases, and this is based on information showing that an organization has performed well, this should provide a 'good reason' to trust it.

Prior research in public administration and political science has offered important insights into the role of knowledge in the effect of information disclosure on trust in government (e.g. Bok, 1997; Cook et al., 2010). Although the cited research refers to knowledge *about* a government organization in general, it could still provide relevant insight into the potential effect of performance outcome knowledge. For example, a lack of knowledge about government processes and actions is argued to cause a lack of trust (Bok, 1997). People tend to be very critical about government activities which they know little about (Blendon et al., 1997: 215). Recently, Park and Blenkinsopp (2011) also found transparency and trust in government to be interrelated.

Cook et al. (2010) found evidence that increased knowledge helps in strengthening citizen trust in a government organization. Using survey data ($N = 2458$), they investigated whether people were more trusting towards the United States (US) Social Security Administration after receiving information from it. According to Cook et al., the information citizens receive in the Social Security Statement provides 'clear, factual, nonpartisan, and personally relevant information about Social Security'. The results were compared with the evaluations of non-recipients. Results support the idea that citizens' evaluations of government are in part affected by the quantity and quality of the information it sends to citizens.

On the other hand, a pessimistic view of the effect of knowledge on trust is distinguished. Higher levels of knowledge about government could breed distrust. Well-known scholars who contend this are Hibbing and Theiss-Moore (1995, 2001). In their studies they found that those who know the American Congress the best tend to like it the least. Efforts to increase understanding of government processes and results may lead only to greater cynicism and distrust.

Having outlined both views on the effect of knowledge, in this article *outcome knowledge* is expected to have two different effects on trust in a government organization. Mondak et al. (2007) found that the effect of knowledge depends on the merits of, in this case, the US Congress. This means that if people have knowledge of a good outcome this positively affects trust, whereas a negative outcome has the contrary effect. If we consider that we have distinguished three dimensions of trust in a government organization (i.e. competence, benevolence and honesty), even more specific effects can be expected. For example, a negative outcome presented in a timely and comprehensible manner would probably lead to less perceived competence and benevolence, yet to more perceived honesty. A positive outcome, on the other hand, is expected to have a positive effect on perceived competence as well. We thus present two hypotheses to test the effect of outcome knowledge on trust in a government organization:

H1a: A high degree of positive performance outcome transparency causes higher levels of knowledge, which is expected to have a positive effect on perceived competence, benevolence and honesty.

H1b: A high degree of negative performance outcome transparency causes higher levels of knowledge, which is expected to have a negative effect on perceived competence and benevolence, yet a positive effect on perceived honesty.

5. An alternative hypothesis for the effect of transparency on trust

The cognitive approach is criticized because it is based on the assumption of a rational citizen who consciously reads and processes information. As described before, this assumption itself has been criticized (e.g. Etzioni, 2010). Therefore, besides the above-mentioned cognitive 'route to trust', an alternative explanation is discussed and hypothesized in this section.

The alternative explanation hypothesizes that citizens do not base their judgement on knowledge per se, but on emotions related to the act of transparency as such. Hence, the organization might not necessarily be scrutinized on the precise content of the information, characterized by cognitive processes, but merely by simpler and more affective cues such as the general image of the government organization. This relates closely to the idea that people are rational

decision-makers only to a limited degree and cannot or are not motivated to process all available information (Etzioni, 2010; March, 1978; Simon, 1957). From social psychology we also know that people's emotions are important when it comes to making decisions: in this study this regards the decision to trust a government organization (or not). A famous study by Damasio, which is described in his book *Descartes' Error* (1994), shows that emotional and subconscious processes are indispensable to decision-making.

How does this relate to the concept of trust? McAllister (1995) and Lewis and Weigert (1985) both reckon that there is an affective dimension of trust. This affective dimension is based on common values and understandings of the truster and the trusted (McAllister, 1995: 26) However, affective trust is generally acknowledged to be more prevalent in interpersonal trust relationships than in institutional trust relations such as trust in government (Lewis and Weigert, 1985). Nevertheless, some scholars acknowledge the role of affection or (subconscious) emotions in citizen–government relations. In general, individuals have limited time and capacity to process information. In order to make decisions, people heavily simplify the options and information available. A decision to trust a government organization may therefore not always be conscious and/or rational. The current debate on 'nudging' in the public domain (Thaler and Sunstein, 2008) closely relates to the idea that people are not only influenced by explicit and persuasive messages, but also by implicit cues hidden in a message. Moreover, people have many subconscious emotions that are important to the citizen–government relations. 'Nudging' refers to influencing these emotions to direct citizens into a certain preferred direction. For instance, a powerful type of 'nudge' is to offer people a default option: if several options are offered on a website and one of them is marked as a default, people tend to choose this option (Thaler and Sunstein, 2008; Tiemeijer, 2011).

People thus do not necessarily make trust decisions based on their cognition. This argument is further confirmed by a theory called the 'primacy of affect' (Zajonc, 1984). Individuals are influenced by a general positive or negative feeling with regard to a mental object. This general feeling of positiveness or negativeness influences the subsequent formation of attitudes or behaviour. This is more closely related to transparency, as this is expected to cause a general feeling of positiveness. A positive effect is expected, since people's general judgement about the act of transparency itself is thought to be positive: being transparent as such is broadly viewed as a virtue (e.g. Birkinshaw, 2006; Hood, 2006: 216). Overall, this means that people are not necessarily influenced by the content of the information, but by a general (positive) judgement of transparency. The following alternative hypothesis is postulated:

H2: A high degree of performance outcome transparency is expected to have an unmediated positive effect on perceived competence, benevolence, and perceived honesty.

6. Method, measures and sample

6.1. Experimental setting and context

The experiment was designed to allow participants to experience different degrees of transparency by visiting a website with government performance information. After visiting this website, they were asked about their trust in the government organization under study by means of a questionnaire. According to Bozeman and Scott (1992), experiments in public administration research must adhere to a sufficient degree of realism to strike a balance between the need for methodological rigour and conditions which adhere to the context of the participants.

The central question (i.e. does performance outcome transparency increase knowledge, and does this affect citizen trust in a government organization?) refers to citizen trust in 'a government organization': in the experimental setting participants specifically looked at information about their municipality. The municipality under study (Utrecht) has a population of approximately 300,000 people. The experiment was carried out in the Netherlands: Dutch municipalities are officially headed by an elected council, while daily operations are led by the mayor and aldermen. The mayor is appointed by the Queen, whereas the aldermen are appointed by their political parties. Based on election results, political parties form a coalition and each political party in the governing coalition generally provides one or more aldermen. Aldermen in the Netherlands are politically accountable for one or more policy issues that they have under their command.

The experimental setting was further construed by a specific policy topic, in this case local air pollution. In the Netherlands, most data on air pollution are gathered and reported at the local level. Each large municipality is obliged by law to produce an annual report. This report is compiled by measuring the amount of toxic pollutants in the air or by estimating parameters using predesigned models containing mathematical formulae. Further, municipalities have the ties closest to citizens, and citizens also have a more direct stake in local issues (Pina et al., 2007: 451; Piotrowski and Van Ryzin, 2007: 309) such as the local environment. Overall, since municipalities have the closest ties with their citizens, and these municipalities play a central role in the disclosure of air pollution figures, this was designed as the setting of the experiment.

6.2. Design

The experiment was designed to provide an optimal test for the hypotheses and consisted of four groups. Four groups were given information to read regarding levels of air pollution in their municipality, varying in timeliness and comprehensibility (low or high) and in the outcome of the policy (good or bad). One group experienced a low transparency of performance outcomes, showing a negative performance outcome, in this case highly polluted air. The second group received information with the same level of transparency; however, they were shown

a positive outcome (i.e. clean air). The third and fourth groups were shown highly transparent – up-to-date and comprehensible – information with either a positive or a negative performance outcome (see Table 1).

To expose the effect of different performance outcomes, the website showed only extremely clean (groups 2 and 4) or extremely polluted air (groups 1 and 3).[1] Performance outcome transparency was operationalized according to the extent to which the information was up-to-date and comprehensible (e.g. Dawes, 2010; Heald, 2006; Larsson, 1998). Both the comprehensibility and timeliness of the information varied across groups simultaneously, which means that only the overall effect can be assessed and not the effect of each element separately. These two dimensions varied across the experimental groups simultaneously in order to create two extreme conditions and thus the highest probability of detecting an effect. Comprehensibility and timeliness of the information in this article is referred to as the 'usability' of the information.

6.3. Sample

The sample consisted of a total of 658 respondents, recruited from a municipality's citizen opinion panel. Variables such as political preference might affect trust in government, and unequal distribution of these background variables potentially threatens the internal validity of the results. To check the distribution of relevant background variables, information regarding them was collected by asking about them in the questionnaire. The most important background variables that might affect trust in government are considered to be gender, age, education and political preference (e.g. Cook and Gronke, 2005; Norris, 2001). The variables displayed in Table 2 are those which might influence trust in a specific government organization and which might thus distort the relation between transparency and trust.

At first sight, the sample shows a rather equal distribution of background characteristics. This was confirmed by a Pearson chi-square test using crosstabs, indeed showing no evidence for an unequal distribution of the aforementioned background variables.[2] This should cancel out confounding effects of these variables on perceived trustworthiness, and for that reason none of the background variables were taken into account in the analysis.

Table 1. Experimental design

		Information timeliness and comprehensibility	
		Low	High
Outcome	Negative	1	3
	Positive	2	4

Table 2. Sample composition

	% male	Av. age	% highly educated	Pol. pref. (% l.w.)
Group 1 website of low transparency, negative performance outcome (N = 175)	50.9	40.6	80.0	65.1
Group 2 website of low transparency, positive performance outcome (N = 160)	40.4	39.9	73.3	64.0
Group 3 highly transparent website, negative performance outcome (N = 168)	44.6	41.0	73.2	58.9
Group 4 highly transparent website, positive performance outcome (N = 177)	44.6	43.1	70.1	62.7
Total (N = 658)	45.1	41.2	74.2	62.7

Pol. pref. (% l.w.) = Percentage of participants that indicated a tendency to vote for a left-wing political party.

6.4. Measures

Performance outcome transparency in this experiment consists of comprehensibility and timeliness. How were both elements measured in this study? First, 'reactivity' is the yardstick against which 'timeliness' is measured: the amount of time between the actual measurement or determination of the performance outcome and the disclosure of these data. Second, the experiment varies in comprehensibility. Although the degree of comprehensibility depends on the expertise and knowledge of each individual, the comprehensibility on a general level is tested by asking participants how understandable they perceived the

information to be. The experiment was designed so that the transparent websites are readily comprehensibly for laymen, whereas the websites with low transparency are only understandable for those with expert knowledge (Table 3).

A figure showing the website with comprehensible and timely information can be found in Appendix A.

To investigate 'trust in a government organization', participants were asked specifically about the perceived benevolence, competence and honesty of the government organization with regard to the topic (local air pollution). All dimensions were measured on a 5-point scale and were derived by following past research conducted by McKnight et al. (2002) and adapting this to the public sector context. Specific item wordings for each dimension (perceived competence, perceived benevolence and perceived honesty) are found in Appendix B. People were also asked to assess their level of knowledge of air pollution outcomes in the municipality and their trust in government in general (items also in Appendix B). Trust in government in general was taken into account to assess whether a participant's general attitude towards government affected trust in a specific government organization.

In order to find a 'purer' effect of transparency on trust in a specific government organization, another covariate was included in the analysis: 'topic engagement'. The first variable measured the effect of a general level of trust in government on trust in a specific organization. The second variable measured the effect of people's

Table 3. Operationalization of performance outcome transparency

Usability element	Source	Operationalization
A. Timeliness Old Recent	Heald, 2006	'Old' and 'recent' information about a performance outcome was made feasible for the experiment as follows: 1. Old data in the experiment consisted of air pollution figures for 2006.[3] 2. Recent data yield air pollution figures updated one hour ago.
B. Comprehensibility Difficult Easy	Drew and Nyerges, 2004; Heald, 2006 Larsson, 1998	Information that was 'difficult' and 'easy' to comprehend was made feasible for the experiment as follows: 1. Difficult: only figure, no explanation. 2. Easy: visual and textual aid to aid in understanding the figures.

concern and engagement with the topic, because the extent to which people are worried about the policy issue itself (i.e. air pollution) may be an important predictor for trust in a government organization.

6.5. Procedure

The aforementioned operationalization was carried out in practice in the experiment as follows. The procedure consisted of four elements: (1) an introduction to the experiment, (2) an instruction, (3) the experiment itself and (4) a post-test questionnaire. Each of these elements will be explained.

A municipality granted permission to make use of a panel of citizens who regularly participated in its online questionnaires. An e-mail was sent on behalf of the municipality and Utrecht University to a panel of 3000 citizens (step 1, introduction to the experiment). This e-mail contained an invitation to people to participate in the experiment. Those who received the e-mail were free to decide whether or not to participate. People had to click on a link which randomly assigned them to one of the groups explained in the previous section.

Participants were first shown the start of the questionnaire with some general questions about prior visits to municipal websites. After this first page of the questionnaire people were instructed to click on a link which led them to one of the four websites in the experiment. Before clicking on the link, the questionnaire instructed participants to read the website and to follow the instructions found there (step 2).

The third part of the procedure was the experiment itself. Each website consisted of two pages. The first page had a general explanation about air pollution in the city and was the same for each group. People were then instructed to click on to the next page, which depicted a map with three stations measuring air pollution. These stations exist in reality; however, the degree of air pollution indicated by each station was manipulated to fit the purposes of the experiment. Participants were further instructed to read the information provided by each of the three measuring stations. After looking at the map with measurement stations, people were instructed to close the window of their browser and to complete the questionnaire.

6.6. Manipulation check

In this section the experimental manipulation was checked. In other words, did participants perceive the experimental treatment in the way the researcher intended? First, participants were asked whether they perceived the data to be up-to-date and, second, if they found it understandable. These are the two key manipulations that constitute data usability in this experiment. Participants in the two highly transparent groups indeed found the data to be much more comprehensible and timely than did participants in the two other groups ($ps < .001$). An additional check was carried out to see whether participants thought the performance outcome was positive. The highly transparent websites with positive and negative performance outcomes were indeed clearly recognized as such ($ps < .01$).

However, visitors to the two non-transparent websites were not able to discern a positive from a negative performance outcome. This was anticipated, as these latter two groups were purposefully provided with figures about air pollution without clarification. A positive or negative performance outcome would probably only be recognized as such by experts.

7. Results

In order to test the effect of transparency on trust in a government organization, two analyses were carried out. First, we needed to separately establish the effect of transparency on knowledge. Second, the individual effect of knowledge on trust in a government organization was tested.

An ANOVA was carried out to assess the effect of performance outcome transparency and the outcome itself on knowledge. The overall effect of transparency on knowledge proved to be significant ($F(1, 654) = 83.61$, $p < .001$),[4] whereas the outcome itself (i.e. negative or positive) ($F(1, 654) = 0.52$, $p = .472$) and the interaction between transparency and outcome ($F(1, 654) = 0.03$, $p = .860$) had no significant effect.[5] This means that participants reported having more knowledge when information was presented in a timely and comprehensible manner. Furthermore, knowledge was not affected by the outcome itself that is shown on the website. In other words, regardless of the performance, transparency contributed to higher levels of knowledge.

The second step in the analysis was to test the effect of transparency and knowledge on trust in a government organization. A two-way MANCOVA was carried out to test the effects.[6] The first factor was 'performance outcome transparency', and the second factor was 'outcome' itself. The effect of performance outcome transparency (i.e. direct effect) and the actual performance outcome were taken into account separately to allow us to assess the magnitude of their effects on all three dependent variables. Covariates included in the model are: trust in government in general and people's level of engagement with the topic. Further, to test whether knowledge has different effects if a positive or negative outcome is presented (Hypotheses 1a and 1b), the interaction term 'knowledge*outcome' is included in the analysis. This measures whether the effect on trust is different if people's knowledge is combined with a particular positive or negative outcome. Univariate results are shown in Table 4.[7]

The first remarkable result is that the outcome as such has no independent effect on trust in a government organization. Also, the interaction between transparency and outcome (for example, highly transparent negative outcomes) has no effect. In other words, even if a negative outcome – in this case polluted air – was presented to a participant, this had no negative effect on their trust. Further, no significant interaction effects between knowledge and outcome were detected.

Table 4 shows that different effects occur for each dimension of trust. Perceived competence was affected by a combination of knowledge and transparency itself. The eta-squared indicates the variance explained by a single variable: transparency

Table 4. Multivariate effects on dependent variables

Variables	Perceived competence		Perceived benevolence		Perceived honesty	
	F-value	Eta^2	F-value	Eta^2	F-value	Eta^2
Factors						
Transparency	7.36**	.011	0.58	.001	0.52	.001
Outcome	2.88	.004	0.18	.000	0.99	.002
Transp*outcome	0.527	.001	0.09	.000	2.86	.004
Mediators/moderators						
Knowledge	27.02[8]**	.040	16.76**	.025	3.09	.005
Knowledge*outcome	4.23	.006	0.44	.001	0.61	.001
Covariates						
Trust in gov't general[9]	210.80**	.245	236.83**	.267	325.29**	.334
Topic concern	30.58**	.045	37.45**	.054	55.68**	.079
Intercept	123.30**	.159	119.01**	.155	133.79**	.171
Df1, Df2	5, 657		5, 657		5, 657	
F	50.04**		50.19**		62.78**	
R^2	.350		.351		.403	
Adjusted R^2	.343		.344		.397	

F-ratios and partial eta^2 are displayed. $N = 658$.
*$p < .05$; **$p < .01$.

explains 1.1 percent of the variance, whereas knowledge accounts for 4.0 percent of the variance. It should be noted that the two covariates in the model, participants' engagement with the topic (4.5 percent), and especially trust in government in general (24.5 percent), were more important predictors for trust in a government organization. Overall, the adjusted R-squared of .343 shows that these variables can explain 34.3 percent of the variance in perceived competence. Parameter estimates (not in table)[10] show that the effects of knowledge and trust in government in general on trust in a government organization were positive. On the other hand, a high engagement with the issue of air pollution negatively affected trust.

Perceived benevolence was not affected by transparency as such, yet a positive effect of knowledge on benevolence was found. Having an eta-squared of 2.5 percent, the effect of knowledge was somewhat weaker than in the case of perceived competence. In contrast, the effects of trust in government in general and topic concern on perceived benevolence were slightly stronger than on perceived competence, and accounted for 26.7 and 5.4 percent, respectively. The adjusted R-squared for perceived benevolence was very similar to that of perceived competence, accounting for 34.4 percent of the overall variance.

The third dimension, perceived honesty, was affected by neither transparency nor knowledge. Remarkably, the effects of trust in government in general and topic concern were much stronger than those of perceived competence and benevolence. Further, the total variance explained by these is somewhat higher (39.7 percent) than these dimensions.

Overall, we have seen that transparency contributed to higher levels of reported performance outcome knowledge. Further, people with higher levels of outcome knowledge perceived the government organization as being more competent and benevolent. In addition, general trust in government explained a large proportion of trust in a specific government organization. Concern about air pollution negatively affected trust and this is an important notion when judging the external validity of the results in the next section.

The following hypotheses were postulated. We will now review whether these should be rejected or not.

H1a: A high degree of positive performance outcome transparency causes higher levels of knowledge, which is expected to have a positive effect on perceived competence, benevolence and honesty.

H1b: A high degree of negative performance outcome transparency causes higher levels of knowledge, which is expected to have a negative effect on perceived competence and benevolence, yet a positive effect on perceived honesty.

H2: A high degree of performance outcome transparency is expected to have a positive effect on perceived competence, benevolence, and perceived honesty.

In contrast to Hypothesis 1b, knowledge had no negative effect on perceived competence and benevolence in cases where there was a negative outcome. Nor did knowledge affect perceived honesty. This means that we can state that knowledge has a positive effect on competence and benevolence, regardless of the outcome presented on the website, rejecting Hypothesis 1b and partly rejecting Hypothesis 1a (which also predicted a positive effect on perceived honesty). Section 5 presented an alternative hypothesis (H2), which postulated that less conscious mental processes are more important to trust. We found some evidence for this hypothesis. A direct effect of transparency on perceived competence was found. However, no other direct effects were found. Hypothesis 2 should therefore largely be rejected.

8. Conclusion and discussion

The results provide very mixed evidence for both a cognitive and affective relation between transparency and trust in government organizations. To what extent could this mixed evidence be a result of the research method itself? In order to assess this, we next discuss the potential limitations of the experiment.

First, the sample might not necessarily reflect the real population closely enough. The issue of external validity of samples in experimental research has been a point of discussion for many years (e.g. Lynch, 1982). In this case, citizens who visit a government website 'for real' can be expected to be citizens who find local air pollution an important issue or are concerned about it. The results showed that 'topic engagement' negatively affects trust in a government organization. In addition, citizens who are really interested in pollutant levels might become annoyed by an incomprehensible website, and this would negatively affect their trust. However, an additional analysis of the results provides no evidence for a particularly negative effect of a lack of transparency on concerned citizens. A group of engaged citizens were selected from the dataset (those who scored 3.5 or higher on the 5-point scale for 'topic engagement'). Next, this set of engaged citizens was tested on the effect of transparency and knowledge, just as the regular sample was. No particularly negative effects of (a lack of) transparency were found in this analysis. Knowledge once more had a positive effect,[11] whereas the direct effect of transparency was too small to be flagged as significant in this sample. This means that there is no a priori reason to believe that engaged citizens react very differently from others to transparency.

Second, there is the asymmetric nature of the experiment. Although all the participants were able to judge a website correctly as 'timely and comprehensible' or not, only half of the participants assessed the outcome correctly, because they were not able to judge the air pollution figures on the non-transparent website. This means that the lack of effect of outcome might partly be explained because people were not able to assess this outcome. That said, the interaction term of transparency and outcome did not yield significant results, either. This means that even when a combination of outcomes were accessible to people, this did not affect trust in a government organization. Hence, the effect of outcome on trust *may* partly be obfuscated because of a lack of transparency, yet this cannot be confirmed by the results.

What does the mixed evidence for both a cognitive and more affective route to trust mean for the debate on transparency and trust explored in this article? One of the main assumptions behind the transparency reforms is that citizens use information, which will increase their knowledge about specific government operations or performance outcomes, which in turn is beneficial for trust in government (Blendon et al., 1997; Bok, 1997; Cook et al., 2010). This assumption was criticized by Etzioni (2010: 399), among others, who argues that people are not rational decision-makers who can properly process complex information. The positive effect of knowledge found in this article seems to support the view that knowledge about government organizations actually contributes to trust. Cook et al. (2010) found that providing citizens with (objective) information about an organization can strengthen their knowledge. In addition, this study confirmed that performance outcome results also have positive effects on specific dimensions of trust (especially perceived competence). On the other hand, the 'primacy of affect' (Zajonc, 1984) – or the general feeling people have about transparency – also

has some effect, as it positively affected perceived competence in the experiment. This effect did not occur for the other dimensions of trust.

Overall, trust in a government organization is affected by both cognitive and emotional processing. In this sense, trust *in a government organization* is also not based solely on conscious cognitive consideration, but on a 'mix of cognition and feeling' (cf. Lewis and Weigert, 1985). The affective side of trust in government might even be more important in real-life situations, since the participants who were studied were specifically asked to read the information on the website, which probably stimulated them to read more closely and scrutinize more consciously.

The results also showed that the magnitude of the effect of performance outcome transparency is limited. The analysis showed that trust in government in general is a very strong determinant of trust in a specific government organization. Existing attitudes towards government are thus far more important than the effect of transparency or knowledge alone. In particular, the more fundamental and ethical dimensions of trust, benevolence and especially honesty, are predetermined by general trust.

Further, it is mainly on perceived competence that performance outcome transparency has a mixed cognitive and affective effect. Perceived benevolence was hardly affected, and honesty not at all. This means that besides reconsidering the nature of antecedents of trust in government organizations, giving citizens 'good reasons' to trust is not *only* a matter of providing them with knowledge. We also need to develop a sense of realism about the effects of transparency. Instead of focusing exclusively on increasing people's knowledge to create understanding, it should be acknowledged that humans are not acting as rational, 'atomized' individuals. In contrast, trust in a specific government organization is not only determined individually but is largely shaped in a broader societal context. Results are in line with prior research by Bouckaert and Van de Walle (2003) who indicated that pre-existing and fundamental ideas about what government does, and whether it is benign or not, are far more determining than what a single government organization is or does.

Notes

1. Different types of toxins in the air determine 'air pollution'. The four most important substances that are measured in the Netherlands are nitrogen dioxide (NO_2), fine dust particles (PM_{10}), benzene (C_6H_6) and carbon monoxide (CO). Because showing figures about all these substances would overload participants with many figures in a short time span, only nitrogen dioxide (NO_2) figures were shown in the experiment. Pollution by nitrogen dioxide is one of the biggest air pollution problems, along with fine dust particles. However, local governments have a greater degree of influence on reducing local levels of nitrogen dioxide, since this type of pollution is mainly caused by cars on local

roads. This is in contrast with the degree of fine dust particles, which are better combatted at the national level.

2. Gender (Pearson chi^2 = 4.69, df = 5, p = .466), Age (Pearson chi^2 = 324.40, df = 315, p = .346), Education (Pearson chi^2 = 9.11, df = 5, p = .105), Political preference (Pearson chi^2 = 1.83, df = 5, p = .873).

3. The experiment was conducted in July 2010.

4. Means (SE): non-transparent group 2.59(.05), transparent group: 3.17(.05).

5. Means (SE): non-transparent group 2.90(.05), transparent group: 2.86(.04).

6. Box's *M* was significant ($p < .01$), however, because the sample sizes were nearly equal. Box's *M* is highly unstable and the multivariate statistic can assumed to be robust (Field, 2005: 599). Further, no problems with multicollinearity were detected and no outliers were evident.

7. Overall multivariate results: Transparency ($F(1, 657) = 3.05$, $p < .05$), Outcome ($F(1, 657) = 2.45$, $p = .063$), Transparency*Outcome ($F(1, 657) = 1.60$, $p = .188$).

8. A significant univariate effect was found for this variable ($p < .05$). However, as the prior multivariate test for knowledge*outcome was non-significant, this interaction term is not flagged as 'significant'.

9. The variable 'trust in government in general' was measured after the experiment, which can be problematic since it may have been affected by transparency. However, an additional analysis (ANOVA) shows that the general level of trust was not affected by the level of transparency ($F(1, 657) = 0.05$, $p = .831$), nor by a positive or negative outcome ($F(1, 657) = 0.24$, $p = 627$).

10. Parameter estimates are the regression coefficients attributed to each effect.

11. Multivariate effect ($F(1, 216) = 3.15$, $p < .05$).

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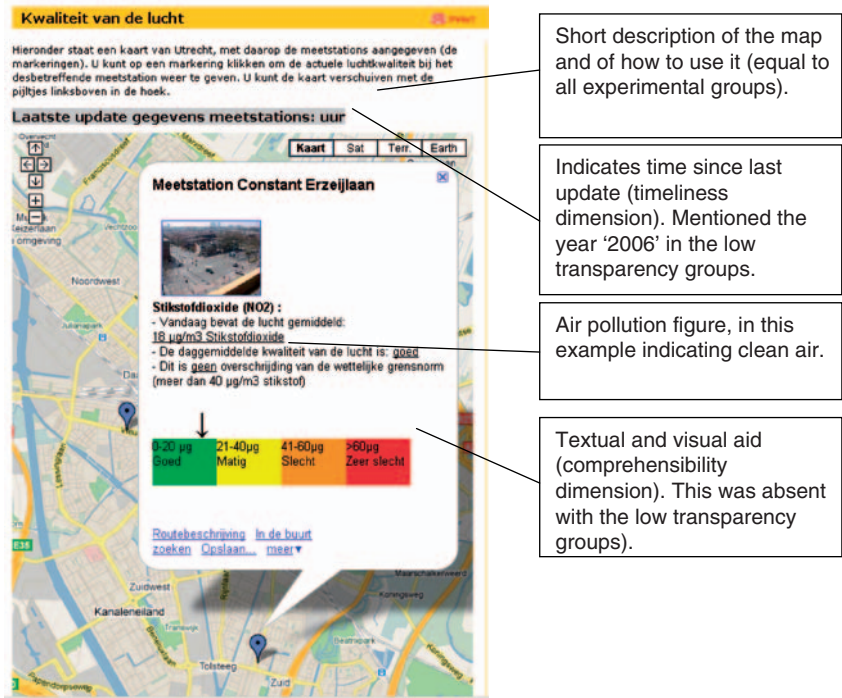
Appendix A

Figure showing comprehensible and timely information in the experimental setting.

Appendix B

Answer categories: 1. Completely disagree/2. Disagree/3. Neither agree nor disagree/4. Agree/5. Completely disagree

Translated competence items (adapted from McKnight et al., 2002)

	Item wording (Cronbach's alpha = 0.89)
C1	The municipality of [name] is capable.
C2	The municipality of [name] is effective.
C3	In general, the municipality of [name] is skilful.
C4	The municipality of [name] is professional.
C5	The municipality of [name] carries out its duty very well.

Translated benevolence items (adapted from McKnight et al., 2002)

	Item wording (Cronbach's alpha = 0.76)
B1	If citizens need help, the municipality of [name] will do its best to help them.
B2	The municipality of [name] acts in the interest of citizens.
B3	The municipality of [name] is genuinely interested in the well-being of citizens, not only in its own.

Translated Honesty items (adapted from McKnight et al., 2002)

	Item wording (Cronbach's alpha = 0.85)
H1	The municipality [name] is honest.
H2	The municipality [name] keeps its commitments.
H3	The municipality [name] is sincere.

Translated specific knowledge items

	Knowledge question items (Cronbach's alpha = 0.68)
K1	Currently I have knowledge about the municipality [name]'s air pollution policy in general.
K2	I have knowledge of the current levels of air pollution in several places in the municipality.

Translated trust in government in general items

	Item wording (Cronbach's alpha = 0.82)
TG1	In general, the government cares about the well-being of citizens.
TG2	In general, the government keeps its promises.
TG3	In general, the government carries out its duties effectively.
TG4	In general, the government carries out its duties effectively.

Translated topic concern items

	Item wording (Cronbach's alpha = 0.92)
TC1	Currently I am very worried about air pollution in [name].
TC2	At this moment I am afraid for the damage to health that can be caused by air pollution in [name].