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Rebuilding public trust in government administrations through e-government actions



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Abstract Citizen trust in the public administration has been reduced worldwide due to recent events such as the current economic situation, corruption cases or disclosure of classified information. This work analyzes whether e-government related actions could be strategically employed to increase citizen trust in the public administration. This research confirms that perceived quality of public e-services has a positive effect on trust in the public administration. In turn, public administration communication (i.e., campaigns to promote the benefits and use of e-government) only influence trust in the public administration for citizens with a favorable attitude towards e-government. These results have interesting implications suggesting in which ways public administration should invest their limited resources in order to recover the levels of citizen trust.

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PALABRAS CLAVE

Confianza en la administración pública;
Servicios públicos electrónicos;
Calidad del servicio electrónico;

Creación de confianza en la administración pública a través de acciones de gobierno electrónico

Resumen La confianza en la administración pública se está reduciendo mundialmente debido a sucesos como la actual crisis económica, casos de corrupción o filtraciones de información clasificada. Este trabajo analiza cómo aumentar la confianza ciudadana en la administración pública mediante acciones relacionadas con el gobierno electrónico. En concreto, los resultados muestran que la calidad de los servicios públicos electrónicos tiene un efecto positivo sobre

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Actitud hacia el gobierno electrónico; Comunicaciones de la administración pública

la confianza en la administración. En cambio, las comunicaciones de la administración pública (i.e., campañas para promocionar los beneficios y uso del gobierno electrónico) sólo influyen en la confianza en la administración para aquellos ciudadanos con una actitud favorable hacia el gobierno electrónico. Estos resultados sugieren interesantes implicaciones para la gestión pública acerca de cómo invertir sus limitados recursos para recuperar los niveles de confianza del ciudadano.

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Introduction

Governments worldwide are facing several recent events – i.e. the current economic situation, corruption cases, the information published by websites such as WikiLeaks, the Snowden’s affair and so on – which are diminishing citizen trust in public administration to a great extent (Yildiz & Saylam, 2013). Recent reports suggest that trust in governments and public institutions are experiencing the greatest decline of the century, being this decrease especially large in European countries as Spain (Bannister & Connolly, 2011; Corporate Excellence, 2012). In sum, less than half of the population all over the world relies on public institutions (Corporate Excellence, 2012). However, governments need citizens’ trust and collaboration to guarantee the success of public initiatives (such as e-government projects, new public policies, etc.) and obtain their expected benefits for the whole society (Kolsaker & Lee-Kelley, 2008). In this respect, citizens’ trust in public administration is crucial to enhance the relationship between citizens and public administration in the long-term (Warkentin, Gefen, Pavlou, & Rose, 2002). Therefore, there is a managerial need to better understand in which actions public administration must invest their limited resources in order to recover the levels of trustworthiness among citizens.

In this way, one of the most important investments made by governments around the world in the last few years is the development of e-government (for example, providing citizens with online public services). In Spain, the public law 11/2007 (*Ley 11/2007, de 22 de junio, de acceso electrónico de los ciudadanos a los servicios públicos*) recognizes the citizens’ right to interact online with the Public Administration in order to, among others, obtain information, make questions or perform transactions. The launching and right management of e-government services represent an instrument benefiting both public administration and citizens (Chan, Hackney, Pan, & Chou, 2011), that highlight the government transformation and its interest to adapt its services to citizens’ needs.

In the last few years, most literature on e-government has primarily focused on citizen adoption of these initiatives (e.g. Carter and Bélanger, 2005; Bélanger & Carter, 2008). Focusing on earlier studies that have analyzed trust in the e-government context, most of these works mainly consider trust as an antecedent factor of e-government adoption (e.g. Bélanger & Carter, 2008; Warkentin et al., 2002), or just focus on trust in a specific public e-service

(e.g. Belanche, Casaló, & Guinalú, 2012; Wu & Chen, 2005). In contrast, there is still a scarcity of works analyzing what are the effects of e-government introduction and whether the development of these interactive initiatives can increase trust in public administration as a whole (e.g. Bannister & Connolly, 2011).

To shed some light in this gap found on this emerging body of literature, this work analyzes how government actions related to e-government initiatives might affect citizens’ trust in public administration. Specifically, the contribution of this research is twofold. First, we evaluate whether investing in e-service quality or in public administration communication serves to increase trust in the public administration as a whole. Second, we investigate to which citizens should be focused these public administration communication in order to maximize its effect on trust in the public administration. That is, we focus on two government instruments devoted to better serve citizens through e-government:

- First, we focus on public e-service quality, which may be considered as an observable “consumer” oriented signal (e.g. Schlosser, White, & Lloyd, 2006) that public administration can use to communicate its abilities and concerns about citizens’ needs and demands. That is, e-service quality represents an investment made by the public administration to better serve the society which implies skills and commitment in its relationship with citizens. E-service quality is the most relevant belief considered by the user to evaluate e-services, and it is usually decomposed into four dimensions: efficiency, privacy, fulfillment and system availability (Parasuraman, Zeithaml, & Malhotra, 2005).
- Second, we focus on public administration communication – such as governmental campaigns, personalized mail, or spotless brick-and mortar locations – that can help communicate the strengths of public e-services (Carter, 2008). This citizen oriented communication focuses on increasing the citizens’ awareness of these services and inform about the benefits of e-government (Teerling & Pieterse, 2010). However, individuals’ resistance to be persuaded by commercial campaigns is a strongly accepted finding in previous research on consumer behavior (e.g. Ahluwalia, 2000; Bansal & Voyer, 2000; Eagly & Chaiken, 1995). In this way, the influence of messages on individuals might depend on their attitude toward the target so that messages are more persuasive when they are consistent with the individuals’ beliefs and evaluations, suggesting an

interaction effect between the two variables. Therefore, in this research we also investigate how a favorable attitude toward e-government might reinforce the effect of public administration communication to build citizen trust.

To do that, this research will focus on the case of Spain because this country: (1) has experienced one of the greatest decreases in citizens' trust in governments and public institutions all over the world (*Corporate Excellence, 2012*), and (2) is making great investments in e-government development due to the mandatory accessibility to public services since 2009.

We structure the remainder of this article as follows: we first provide a brief review of the trust concept and applied it to the context of the public administration. Then, we describe its main antecedents considered in this work and propose the research hypotheses. After, we explain the data collection and measure validation processes. Our research also includes the explanation of the orthogonalizing technique as a method used to evaluate interaction effects when using structural equation modeling (*Little, Card, Bovaird, Preacher, & Crandall, 2007*). Finally, we discuss the results and their main implications for e-government managers, as well as noting the main study limitations that open future research lines.

Research framework

Trust in the public administration

Trust is a complex concept that has received large attention in marketing literature (e.g. *Morgan & Hunt, 1994; Doney & Cannon, 1997*) because it is considered a crucial aspect to maintain long-term oriented relationships (e.g. *Anderson & Narus, 1990*). Therefore, trust building has been considered a major goal by many organizations since it has been associated to several profitable outcomes (such as commitment, loyalty, positive WOM, etc.; *Schlosser et al., 2006*). The most generally accepted definition of trust describes it as the willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other party will perform a particular action, irrespective of the *trustor* ability to monitor or control (*Mayer, Davis, & Schoorman, 1995*).

Similar to companies, in the case of public management, governments aim to increase citizens' trust on public administration and invest their time and resources to achieve this goal and to maintain satisfactory long-term relationships with citizens. Literature on public administration has noted a clear decline in the levels of citizen trust on governments all around the world (*Al-Adawi, Yousafzai, & Pallister, 2005*), especially in Europe (*Bannister & Connolly, 2011; Corporate Excellence, 2012*). However, there is not a consensus about the crucial factors increasing or decreasing trust (*Al-Adawi et al., 2005*). Indeed, diverse elements such as political scandals, economic instability, mass-media information, government popularity or governmental performance have been mentioned as possible determinants of governments' trustworthiness (*Bannister & Connolly, 2011; Welch, Hinnant, & Moon, 2005*). Literature on e-government

also has focused on trust as a key factor that needs to be carefully analyzed (*Beldad, Van Der Geest, de Jong, & Steehouder, 2012*). However, most of e-government works mainly consider trust as an antecedent factor of e-services adoption (e.g. *Bélanger & Carter, 2008; Warkentin et al., 2002*), or just focus on trust in a specific public e-service (e.g. *Belanche et al., 2012; Wu & Chen, 2005*). In contrast, few works have focused on trust in the public administration as a whole, and consider it an independent variable (e.g. *Carter and Bélanger, 2005*). In other words, creating trust in the government has been considered as a determinant of e-government adoption, but not as a public policy goal by itself (*Arduini & Zanfei, 2014*).

From a relationship marketing perspective, it has been proposed that e-government development is crucial to build trust-based relationships between citizens and the public administration (*Bélanger & Carter, 2008*). Nevertheless, little research effort has been done to analyze how e-government policies or specific related actions may increase the citizens' level of trust in public administration (*Bannister & Connolly, 2011*). Following *Bannister and Connolly (2011, p. 141)* comments, "of greatest interest to governments is not just that trust in government will lead to more e-Government take-up, but that e-government take-up will lead to greater trust in government". Currently, given the low level of citizen trust on public institutions, the question of interest is whether citizens may increase their trust levels in public administration as a result of e-government initiatives (for example, due to improvements in the perceived efficiency). The scarce literature on this emerging topic found equivocal results: some works have found that citizens who trust the government more tend to use government websites and vice versa (*Parent, Vandebek, & Gemino, 2005*), while others found that e-government initiatives only increase trust in the public administration at the local level (*Tolbert and Mossberger, 2006*).

Our work is an attempt to deepen this insight by analyzing which e-government related actions (e-service quality and public administration communication) might affect citizens' trust in the public administration. Although initial research on trust (e.g. *Moorman, Deshpandé, & Zaltman, 1993; Morgan & Hunt, 1994*) conceptualizes this concept as a set of beliefs and have divided trust into different dimensions (e.g., honesty, integrity, benevolence, competence), since the main interest of this paper is to understand whether governments can build trust in public administration rather than conceptualizing the trust concept in-depth, our trust measure focuses on citizens beliefs of overall trust in the public administration. This is consistent with previous research in public administration, which mainly centers on overall trust (e.g. *Carter and Bélanger, 2005; Carter, 2008; Welch et al., 2005*). In sum, we try to find how the government limited resources should be invested in order to improve overall public administration reliability among citizens.

Antecedents of trust in the public administration

This work focuses on two actions related to public e-services in which governments are working in their aim to increase citizens' trust: e-service quality and public administra-

tion communication. We aim to understand to what extent investing in these actions may affect trust in the public administration as a whole. In addition, we consider attitude toward e-government as a control variable since it is reasonable to think that citizens with a favorable attitude toward e-government will tend to trust in the public administration because of e-government initiatives launching. Finally, an interaction effect between public administration communication and attitude toward e-government is also proposed.

E-service quality

First, e-service quality is defined as the degree to which a website enables efficient and effective shopping, purchasing and delivery (Zeithaml, Parasuraman, & Malhotra, 2002). A good management of public e-services is relevant for citizens given the inherent properties of services (heterogeneity, intangibility, etc.), the characteristics of the Internet (i.e. impersonal and distant channel), and the delicate nature of the data involved in public e-service transactions. E-service quality is probably the most relevant belief considered by the user to evaluate e-services, and it is usually reflected in elements such as efficiency, privacy, fulfillment and system availability (Parasuraman et al., 2005), so that it is mostly conceptualized as multidimensional construct in previous research (e.g. Fassnacht and Kose, 2006).

Despite recent approaches of quality as an evaluation of a hedonic or transformative service experience (Arduini & Zanfei, 2014; Bauer, Falk, & Hammerschmidt, 2006), we maintain the traditional approach of public e-service quality as a result of an effective management of basic informational or transactional citizen oriented services (Halaris, Magoutas, Papadomichelaki, & Mentzas, 2007). This view agrees with the general e-service quality evaluation of the marketer's functional capabilities in e-commerce (e.g. Mcknight, Choudhury, & Kacmar, 2002), and seems particularly appropriate at initial stages of e-government development, as it is the case of our research. In this sense, we rely on the E-S-QUAL conceptualization of quality (Parasuraman et al., 2005) that has been widely recognized in previous literature and considered as a suitable framework for evaluating the effectiveness of e-service management (Kaisara & Pather, 2011; Sahadev & Purani, 2008).

In online marketing literature e-service quality has been traditionally considered as a cue of e-service trustworthiness, but it has also been proposed to positively impact trust attributions to the provider of the e-service (McKnight et al., 2002), the public administration in this case. Similar to the e-commerce context (e.g. Schlosser et al., 2006), investing in e-service quality may be an observable cue to communicate the public administration abilities and concern to meet citizens' needs and demands. As well, e-service quality, observed in the absence of errors or the fulfillment of promises, increases users' confidence on the technical capability of the e-service and the willingness to rely on the organization providing the service (Sahadev & Purani, 2008). Therefore, citizens can make inferences about the public administration based on e-service quality (for example, a well-functioning public e-service could assure to some extent that the public administration knows how to provide the service successfully). We thus propose that:

Hypothesis 1. Public e-service quality has a positive influence on trust in the public administration.

Public administration communication

Second, we define public administration communication as the governmental communication actions directed toward citizens and focused on improving citizens' awareness, knowledge or convenience perceptions of e-government services (for instance, governmental campaigns to promote the advantages of an e-tax payment system and its use). This concept is similar to other terms referring to organization persuasive information related to e-services in the private domain, such as commercial communication (Bauer, Reichardt, Barnes, & Neumann, 2005).

Similar to companies' communication, public administration also communicates the advantages of a secure, convenient and successful provision of e-government services. These communications might influence trust in the public administration too since these messages can be used by citizens not only to shape beliefs about public e-services, but also about the public administration because it has no commercial self-interest but a public one (e.g. Jorgensen & Cable, 2002), and could be interpreted as a sign of the public administration competence and determination to better inform and serve citizens (Carter, 2008; Welch et al., 2005). In addition, public administration communication could be perceived as an additional social support among the citizenship (e.g. personal recommendations by public servants, or campaigns showing citizens as users of public e-services), which increase trust in the public administration by means of social interest and support (Mitra, Reiss, & Capella, 1999). In sum, due to the public sector values, such as serving the community (Gould-Williams & Gatenby, 2010), these communications might be seen as another observable cue of the public administration concern to satisfy citizens' needs in the best interest to the public. Based on this, we propose our second hypothesis:

Hypothesis 2. Public administration communication has a positive influence on trust in the public administration.

However, previous research on consumer behavior suggests that the influence of messages (such as public administration communication) on individuals might depend on their attitude toward the target (e.g. Ahluwalia, 2000). Attitude refers to an affective-evaluative predisposition to respond favorably or unfavorably toward an object or a target (Shaver, 1977), in this way, messages are more persuasive when they are consistent with these judgments because individuals try to resist attitude change (e.g. Ahluwalia, 2000). Literature also suggest that trust is influenced by dispositions and personal principles, so there is an intrinsic and diffused citizen's support toward the government that shapes the functional value of specific government actions (Warkentin et al., 2002; Parent et al., 2005). Therefore, when citizens have a more positive attitude toward e-government, public administration communication will be more congruent with their previous thoughts and thus will influence citizens' trusting beliefs toward public administration to a higher extent. Our last hypothesis suggests that:

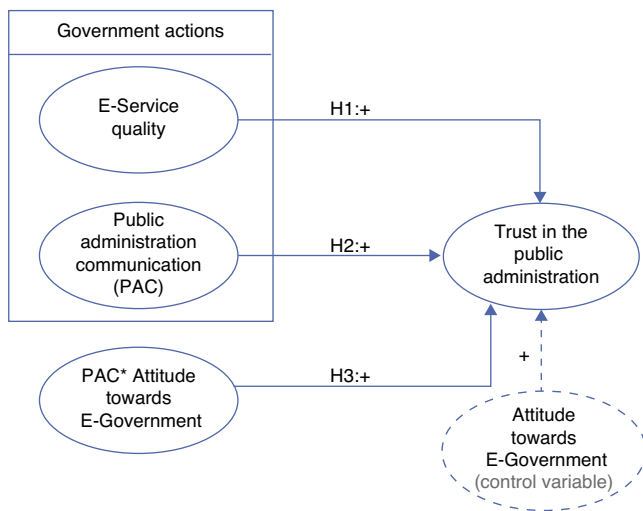


Figure 1 Proposed model.

Hypothesis 3. A positive attitude toward e-government reinforces the influence of public administration communication on trust in the public administration.

Our research model is shown in Fig. 1. As can be seen, we also include the direct effect of attitude toward e-government on trust in the public administration for control purposes. This control variable supposes that citizens holding a favorable attitude toward e-government may increase their trust in the public administration because with the launching of e-government meet their needs and demands. This effect may hold independent of attitude interaction with public administration communication.

Data collection

In consistence with habitual research practice in the online context (e.g. Ho & Dempsey, 2010; Steenkamp & Geyskens, 2006), data were collected through a web survey targeted at citizens who used public e-services in Spain. In order to achieve the greatest amount of responses, an online promotional strategy in collaboration with public web site administrators was performed. Specifically, the survey was announced in different government websites and discussion forums related to public e-services. Potential interviewees were linked to a specific website where they could answer the questionnaire and obtain all the information about the research project. Similar to the recommendations of Roberts, Varki, and Brodie (2003), citizens could choose the public e-service to analyze due to the fact that the objective of this work was to understand citizen behavior regardless of what type of public e-service was being distributed. Therefore, they responded about a wide range of public e-services (for example, driving license renewal, subsidy application, information applications, etc.) from different administration levels (local, regional, national), which favored variability in the perceived levels of the measured variables. Participants were required to have used a public e-service provided by a Spanish agency in the last year, so that they could evaluate the perceived quality of

the e-service. Therefore, we deliberately excluded answers analyzing public e-services developed by other countries.

Constructs were measured using multiple-item measurement scales and respondents were asked to indicate their agreement to a set of statements regarding the constructs under study. E-service quality was measured by a reduced version of the four dimensions E-S-QUAL scale (efficiency, privacy, fulfillment and system availability) developed by Parasuraman et al. (2005) and adapted to the public e-service context. Although other authors propose many alternative scales or additional dimensions (Kaisara & Pather, 2011), the Parasuraman et al. (2005) measurement is a widely accepted framework (Sahadev & Purani, 2008) suitable to our conceptualization of quality as the efficient management of the kind of e-services considered in this research (Halaris et al., 2007). As the public administration communication concept has received little research attention, we adapted previous scales on analogous constructs in the private context such as external informative influence (Bhattacharjee, 2000) and store advertising frequency (Yoo, Donthu, & Lee, 2000). To assess attitude toward e-government we rely on well-established scales of attitude toward information systems proposed in technology adoption literature (e.g. Wu & Chen, 2005). Thus, our work does not consider broader conceptualizations of e-government attitude as holistic evaluations of e-governance principles and achievements (e.g. Kolsaker & Lee-Kelley, 2008). A general measurement of citizen trust in the public administration was taken from works dealing with trust in the government or trust in the merchant in e-services studies (Carter and Bélanger, 2005; Lee & Turban, 2001). Since the main interest of this paper is to understand whether governments can build trust in public administration, rather than conceptualizing the trust concept in-depth, and for the sake of brevity in the collection of responses to our questionnaire, we maintained a general measurement of trust in agreement with previous operationalization of trust in the public administration (Carter, 2008; Welch et al., 2005).

Specifically, answers to the scales were recorded on 7-point Likert scales, ranging from "totally disagree" (1) to "totally agree" (7). The final sample reached a total size of 448 valid cases (after removing atypical cases, repeated responses, and incomplete questionnaires). Finally, although we followed a non-random method of collecting data that relies on volunteer sampling, respondents were almost equally distributed between males (55.36%) and females (44.64%) and in terms of age (less than 35 years [36.38%], between 35 and 44 years [33.71%], 45 or more years [29.91%]), and most of them had completed university studies (62.05%).

Measures validation

As previously noted, the initial set of items was proposed from an in-depth analysis of the literature on e-service quality, adoption theories and public marketing, which ensured content validity. Then, items were adapted to the research context according to the opinions of a group of ten experts in marketing, management and psychology. They had to classify each item as "clearly representative," "somewhat representative," or "not representative" of each construct

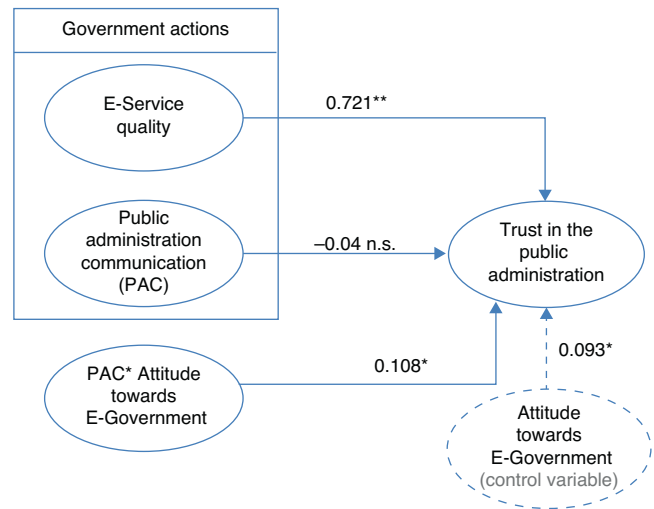
to guarantee face validity according to the [Zaichkowsky's \(1985\)](#) method. Only those items reaching a high level of consensus among the group of experts were retained for the research questionnaire ([Lichtenstein, Netemeyer, & Burton, 1990](#)). The final measures used in this research are detailed in [Appendix A.1](#).

The validation process started with an initial exploratory analysis of reliability and dimensionality using the statistical software SPSS 19.0. The Cronbach's alpha indicator was used to assess the initial reliability of the scales, obtaining values over the minimum of 0.7 ([Cronbach, 1970](#)) in all cases. Item-total correlation was used to improve the levels of the Cronbach's alpha; all items exceed the minimum value of 0.3 ([De Vaus, 2001](#)). Likewise, an exploratory factor analysis was performed in order to evaluate the unidimensionality of the proposed scales. Only one factor was extracted from each scale: efficiency, privacy, fulfillment and system availability, public administration communication, attitude toward e-government, and citizen trust in the public administration.

In order to confirm the dimensional structure of the scales, we used a Confirmatory Factor Analysis, using EQS 6.1 software. We chose the robust maximum likelihood as the estimation method. Then we evaluated convergent validity. First, acceptable levels of convergence, R^2 and model fit were obtained ($\chi^2 = 506.628$, 188 d.f., $p < 0.001$; non-normed fit index [NNFI] = 0.966; confirmatory fit index [CFI] = 0.972; incremental fit index [IFI] = 0.972; root mean square error of approximation [RMSEA] = 0.047). Second, convergent validity was tested by checking whether factor loadings of the confirmatory model were statistically significant (weak convergence criterion, [[Jöreskog & Sörbom, 1993](#)]) and higher than 0.5 points (strong convergence criterion, [[Jöreskog & Sörbom, 1993](#)]). All items satisfied both criteria, as can be seen in [Table 1](#), and therefore no item was eliminated. Third, we also analyzed convergent validity by confirming that the Average Variance Extracted [AVE] was 0.5 or above ([Fornell & Larcker, 1981](#)), as can be seen in [Table 2](#). We also checked that composite reliabilities exceed the minimum of 0.65 recommended in the literature ([Steenkamp & Geyskens, 2006](#)), confirming construct reliability (see [Table 2](#)).

As well, we tested discriminant validity by checking that each construct shares more variance with its measures than the variance it shares with the other constructs in the model. Following [Wiertz and de Ruyter \(2007\)](#), to guarantee discriminant validity, the squared root of the AVE (diagonal elements in bold in [Table 2](#)) has to be greater than the correlations among constructs (off-diagonal elements in italics in [Table 2](#)). All constructs satisfied this criterion (see [Table 2](#)) and showed acceptable levels of discriminant validity.

Finally, with the aim of confirming the existence of multidimensionality in e-service quality, we developed a Rival Models Strategy ([Anderson & Gerbing, 1988](#)), by comparing a second order model in which the construct is measured by the four dimensions considered (efficiency, privacy, fulfillment and system availability) with a first order model in which all the items formed only one factor. Results showed a better fit for the second order model (as can be seen in [Table 3](#)) which implies that e-service quality has a multidimensional nature, as it has been found in previous literature (e.g. [Parasuraman et al., 2005](#); [Fassnacht and Kose, 2006](#)).



Note: ** significant at the level of 0.01; *significant at the level of 0.05; n.s. non-significant coefficients.

Figure 2 Structural equation model. Standardized solution.

Results

We developed a structural equation model using EQS 6.1 software in order to test the proposed hypotheses. As well, the interaction effect proposed in hypothesis 3 was analyzed applying the orthogonalizing technique ([Little, Bovaird, & Widaman, 2006](#)). Among other advantages, this technique guarantees that: (a) the product indicators of the interaction term will not be correlated with the corresponding main effect indicators, and (b) model fit will not be degraded when the interaction latent construct is brought into the research model ([Little et al., 2007](#)). Specifically, the linear information of the interaction term associated with the main effect indicators is removed and therefore, the estimates for the latent main effects are unchanged between the model in which the interaction construct is present and when it is not included in the model ([Little et al., 2006](#)). The orthogonalizing technique consists of the following steps. The first step is the formation of all possible products of the indicators of the two interacting constructs ([Little et al., 2007](#)). In this case, attitude has four indicators and public administration communication has three indicators; so twelve total product variables are calculated. In the second step, each of the 12 product indicators is regressed onto the indicators of both attitude and public administration communication in order to remove any of the main-effect information that is contained in any of the indicators of both constructs ([Little et al., 2007](#)). Finally, for each regression, the residuals of the prediction are saved and considered as the new orthogonalized indicators that are then entered into the SEM model as the indicators of the latent interaction construct. Therefore, this technique offers more coefficients than other alternatives like mean-centering ([Little et al., 2007](#)).

As can be seen in [Fig. 2](#) and [Table 4](#), results support hypothesis 1 at the 0.01 level, confirming the positive effect of e-service quality on trust in the public administration. On the other hand, hypothesis 2 is not supported, so public administration communication does not have a

Table 1 Confirmatory factor analysis: standardized solution.

ITEM	Factor Loading	t-Value	Item R ²	ITEM	Factor loading	t-Value	Item R ²
FUL1	0.904	35.245	0.818	PAC1	0.858	27.917	0.736
FUL2	0.933	34.408	0.870	PAC2	0.926	30.069	0.857
FUL3	0.888	32.359	0.789	PAC3	0.847	23.096	0.717
PRIV1	0.920	22.979	0.847	TPA1	0.906	26.070	0.821
PRIV2	0.820	25.793	0.672	TPA2	0.952	35.697	0.906
PRIV3	0.953	27.689	0.909	TPA3	0.870	26.748	0.756
SYS1	0.838	14.238	0.703	ATT1	0.784	14.527	0.614
SYS2	0.846	13.982	0.716	ATT2	0.822	23.402	0.675
SYS3	0.776	14.841	0.602	ATT3	0.915	24.338	0.838
EFF1	0.914	21.179	0.836	ATT4	0.853	16.831	0.728
EFF2	0.963	25.331	0.928				
EFF3	0.948	26.700	0.898				

Note: All factor loadings are significant at the level of 0.01. FUL = fulfillment, PRIV = privacy, SYS = system availability, EFF = efficiency, PAC = public administrations communication, TPA = trust in the public administration, ATT = attitude.

Table 2 Convergent and discriminant validity.

Scale	α	ρ_c	AVE	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fulfillment (1)	0.933	0.934	0.825	0.908						
Privacy (2)	0.921	0.927	0.809	0.590	0.899					
System availability (3)	0.859	0.861	0.673	0.247	0.299	0.820				
Efficiency (4)	0.958	0.959	0.887	0.346	0.398	0.423	0.942			
Public Adm. communication (5)	0.910	0.909	0.770	0.442	0.419	0.230	0.283	0.877		
Trust (6)	0.933	0.935	0.828	0.534	0.502	0.251	0.608	0.321	0.910	
Attitude (7)	0.907	0.909	0.714	0.589	0.783	0.367	0.505	0.472	0.565	0.845

Note: All correlations are significant at the level of 0.01.

Table 3 Fit indices for the multidimensionality analysis.

Model	N	χ^2 ($p > 0.05$)	NNFI (> 0.95)	CFI (> 0.95)	IFI (> 0.95)	RMSEA (< 0.08)	90% interval RMSEA
First order model	448	2823.816 (54 d.f.), $p < 0.01$	0.372	0.486	0.488	0.266	[0.255; 0.277]
Second order model	448	157.999 (53 d.f.), $p < 0.01$	0.974	0.979	0.979	0.054	[0.041; 0.066]

Table 4 Path estimates and explained variance of endogenous variable.

Hypothesis		Standardized Path coefficient	t-Value	Significance	Endogenous variable	R ²
H1	E-S-QUAL → TRUST	0.721**	13.145	Supported	Trust in the public administration	0.540
H2	PAC → TRUST	-0.004 (n.s.)	-0.095	Not supported		
H3	PAC*ATT → TRUST	0.108*	2.209	Supported		
CONTROL	ATT → TRUST	0.093*	2.015	Supported		

Note: PAC = public administration communication, ATT = attitude toward e-government, n.s. = non-significant coefficients.

* Significant at the level of 0.05.

** Significant at the level of 0.01.

significant direct effect on citizen trust in the public administration. Hypothesis 3 is also supported at the 0.05 level, confirming that public administration communication has a greater effect when they are consistent with citizens' attitude toward e-government. The interpretation of this result suggests that public administration messages promoting e-government are more effective to build trust for those citizens with a favorable attitude toward e-government. As well, the control variable – attitude toward e-government – also has a significant influence per se ($p < 0.05$) on trust in the public administration as expected.

The model fit is also acceptable ($\chi^2 = 1415.959$, 490 d.f., $p < 0.001$; NNFI = 0.949; CFI = 0.956; IFI = 0.956; RMSEA = 0.04; normed $\chi^2 = 2.889$) and we can partially explain the endogenous variable: trust in the public administration ($R^2 = 0.540$).

Post hoc analysis

We further examined the details of the interaction effect between public administration communication and attitude toward e-government by following the suggestion of Aiken and West (1991), and derived the simple slopes. Regressions were thus conducted at high and low levels of attitude toward e-government. To do that, following García, Sanzo, and Trespalacios (2008), we split the sample at the arithmetic mean of the attitude moderator ($M = 5.34$; std. dev. = 1.61), and then eliminated cases within half of the standard deviation around the mean. We obtained subsamples of citizens reporting low levels of attitude ($N = 118$) and high levels of attitude ($N = 176$).

For citizens with higher levels of attitude toward e-government, the relationship between public administration communication and trust in the public administration was positive and significant at the 0.1 level ($\beta = 0.161$, $t = 1.892$, $p < 0.1$). However, this relationship was negative and significant for citizens with lower levels of attitude ($\beta = -0.282$, $t = -2.227$, $p < 0.05$). A multisample analyses, which compares the goodness of fit (χ^2) between a full structural equations model with a restricted model that fixed the unstandardized regression coefficients to be equal in each group (Baker & Sinkula, 1999), also confirmed the difference in this parameter between both groups ($\chi^2 = 6.303$, $p < 0.05$) and provides support for the interaction term.

Conclusions and managerial implications

In today's society, most governments are carrying actions to: (1) improve the levels of citizens' trust in the public administration (levels that have been dramatically reduced in the last few years), and (2) provide citizens with public e-services adapted to current citizens needs. Accordingly, this work explores how e-government related actions (such as investing in e-service quality or in public administration communication to promote its advantages) may help develop trust in the public administration. To date, most studies have considered that trust in government will lead to more e-government adoption or just analyze how to increase trust in public e-services perceived by citizens as risky. Thus, this study advances on the study of e-government from a higher perspective and adds to previous literature

by clarifying to what extent e-government initiatives may lead to greater overall trust in public administration.

First, results show that perceived e-service quality has a strong positive effect on trust in public administration, suggesting that governments should make a great investment to ensure quality when providing citizens with public e-services. This result is consistent with earlier literature, which suggest that e-service quality is the most relevant belief when evaluating e-services (Parasuraman et al., 2005), and a broad range of previous studies have found that trust is driven by e-service quality (e.g. Harris & Goode, 2004; Hwang & Kim, 2007), also in the e-government context (Che-Wee, benbasat, & cenfetelli, 2008). However, our finding also contributes to literature on e-government quality, which has mainly focused on the link between e-service quality and citizen trust in e-government (e.g. Che-Wee et al., 2008), but ignoring the influence on trust in the public administration as a whole. Looking at the dimensions of e-service quality, it seems that public administration should make services accessible and compatible for a wide range of citizens, provide a strong privacy statement, minimize errors, or favor simplicity of use as good ways to invest public funding when developing public e-services. From a theoretical perspective, investing in e-service quality offers an observable cue that citizens can use to make inferences about the skills and commitment of citizen oriented services by public management. This is supported by signaling theory, which suggests that individuals make inferences about objects (e.g., the public administration) using signals such as tangible product attributes or perceived investments (Schlosser et al., 2006). Specifically, citizens may perceive that the public administration is working to better adjust service provision to citizens demands by enhancing the level of quality in e-government services. In sum, it seems that public administration can invest in e-service quality as a way to show its concerns and abilities in serving citizens' needs and demands.

Second, public administration communication seems to have no direct effect on trust. Like it is used to happen with private sector advertisement (Bansal & Voyer, 2000), this lack of efficacy could be the result of the citizen's rejection of commercial messages from an organization about the attributes of its own services. To our results, the influence of public administration communication becomes significant when these messages are consistent with citizens' attitudes. Therefore, a second contribution of this study is that it explains under what circumstances public administration communication affects citizen's trust. Interestingly, a multisample analysis reveals that public administration communication has a positive effect on trust in the public administration for those individuals with a more positive attitude toward e-government, probably because this communication reinforces their own beliefs. This is consistent with previous literature (e.g. Ahluwalia, 2000) that suggests that messages are more persuasive when they are consistent with individual's attitude. However, this effect turns negative for those individuals with an unfavorable attitude toward e-government. In this case, since people try to resist attitude changes (e.g. Ahluwalia, 2000), citizens may judge negatively these communication actions and reduce trust levels in the public administration. As well, a reactance effect may appear if the citizen derives from the public

administration communication an obligation to use public e-services. Consistent with [Brehm \(1966\)](#) and [Algesheimer, Dholakia, and Herrmann \(2005\)](#), if perception of constraints increases, citizens may experience reactance which involves negative consequences (in this case, a decrease in trust levels).

This result has an interesting implication as a segmentation strategy to target different communication campaigns depending on citizens' needs and demands and in order to match with them. Governments should conduct promotional campaigns on those individuals with a positive attitude toward e-government (maybe those that already use the online channel to carry out transactions, digital natives that start a relationship with the public administration, etc.) in order to reinforce their beliefs and be more effective to build trust in the public administration. As a result of this positive attitude, other interesting consequences might arise. For instance, online channels could be the right media to deliver messages to citizens with a favorable attitude toward e-government, and thus to increase their level of trust in public administration. Public administration should find alternative ways to increase the trust of citizens with an unfavorable attitude toward e-government. To achieve this challenge, governments could rely on citizens with a more favorable attitude who might start a positive word-of-mouth about these new public administration initiatives, expanding trust to other citizens (family, friends, etc.). Indeed, social campaigns and peer recommendations are usually considered as more objective and persuasive, since individuals have nothing to gain from fellow citizens' subsequent behaviors ([Schiffman & Kanuk, 1997](#)).

Limitations and future research lines

In spite of these interesting results, this work has some limitations that allow us to establish interesting lines for future research. First of all, it is important to note that data were collected following a non-random process, and the survey was answered exclusively by Spanish-speaking users of public e-services in Spain. Since previous studies propose that cultural differences may affect e-government adoption (e.g., [Carter & Weerakkody, 2008](#)), the outcomes of e-government initiatives may differ across cultures too. Thus, to generalize the results of this research, we should repeat the study using a wider sample of respondents that represent a greater diversity of nationalities and cultures (e.g., Anglo-saxon, Asian, etc.), and that analyze public e-services from different countries.

Second, we have only considered direct public administration communication in our research model because the aim of the paper is to analyze whether government actions related to e-government affect trust in the public administration. As we have said, it is possible that external information coming from interpersonal sources (family, friends, etc.), or even from the mass media can also influence trust in the public administration ([Yildiz & Saylam, 2013](#)). Therefore, an interesting route to extend this research may be the analysis of other information sources influencing the levels of citizen trust in the public administration.

Third, we would like to note that in this paper we have enquired participants whether they had used public e-services before (so that they can evaluate e-service quality), and therefore their responses might be biased positively; especially their attitude toward e-government. According to data, although being high in many cases, attitude toward e-government presents a high variation among respondents in terms of standard deviation ($M = 5.34$, $std. dev. = 1.61$).

Finally, due to the recent events that have diminished citizens' trust, this work has drawn attention on trust in the public administration. It may be useful that future works also analyze alternative dependent variables or the possible consequences of trust recovery, such as changes in citizens' commitment, beliefs (e.g. perceived image of the public administration), or behaviors (e.g. positive word-of-mouth), and the possible mediating role that trust may exert between government actions and these variables.

To sum up, this is a preliminary work that contributes to shed some light on the difficult task of increasing citizen trust in the public administration. Further research should continue focusing on the interrelation between effective actions and communication strategies which aims to restore citizens' trust in their governments, and the analysis of the consequences derived from trust growth.

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Conflict of interest

The authors declare no conflict of interest.

Appendix A.1. Research constructs and items

E-S-QUAL:

- a. *Efficiency*: (adapted from [Parasuraman et al. \(2005\)](#))
 - This public e-service...
 - EFF1. ...makes it easy to find what I need.
 - EFF2. ...is well organized.
 - EFF3. ...is simple to use.
- b. *Privacy*: (adapted from [Parasuraman et al. \(2005\)](#), [Kim, Ferrin, and Rao \(2008\)](#))
 - PRIV1. I feel my privacy is protected on this public e-service.
 - PRIV2. This public e-service does not share my personal information with other sites.
 - PRIV3. This public e-service protects my information against other uses.
- c. *Fulfillment*: (adapted from [Parasuraman et al. \(2005\)](#))
 - This public e-service...
 - FUL1. ...is truthful about its offerings.
 - FUL2. ...delivers results as promised.
 - FUL3. ...works according to my orders.
- d. *System availability*: (adapted from [Parasuraman et al. \(2005\)](#), [Taylor and Todd \(1995\)](#))

SYS1. This public e-service launches and runs right away.

SYS2. This public e-service is available whenever I need it.

SYS3. The public e-service technology is compatible with the software I use.

Public administration communication: (adapted from Bhattacherjee (2000), Yoo et al. (2000))

The public administration...

PAC1. ...communicates its readiness for public e-services frequently.

PAC2. ...communicates a positive feeling about using public e-services.

PAC3. ...recommends the use of public e-services.

Attitude toward e-government: (adapted from Bhattacherjee (2000), Wu and Chen (2005))

Using public e-services...

ATT1. ...is an idea I like.

ATT2. ...would be a pleasant experience.

ATT3. ...is a good idea.

ATT4. ...is a wise idea.

Trust in the public administration: (adapted from Carter and Bélanger (2005), Lee and Turban (2001))

TPA1. I trust the public administration.

TPA2. The public administration is a reliable organization to carry out transactions.

TPA3. When making transactions the public administration is trustworthy.

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