

The Effects of E-Government on Trust and Confidence in Government

Karen Mossberger
Associate Professor
Graduate Program in Public Administration (MC 278)
College of Urban Planning and Public Affairs
University of Illinois at Chicago
Chicago, IL 60607
312.413.8246
FAX: 312.996.8804
mossberg@uic.edu

Caroline Tolbert
Associate Professor
Department of Political Science
Kent State University
Kent, OH 44242
330.672.0904
FAX: 330.672.3362
Ctolber1@kent.edu

Prepared for delivery at the 2005 Annual Meeting of the
American Political Science Association, September 1-4, 2005. Copyright by the
American Political Science Association

The Effects of E-Government on Trust and Confidence in Government

Abstract

Trust in government has been declining for more than three decades now. E-government has been proposed as a way to increase citizen trust in government, and to improve citizen evaluations of government more generally. Using two-stage models to analyze recent (2001) Pew survey data, we explore the relationship between e-government use, attitudes about e-government, and finally, trust in government. There is a statistically significant relationship between trust and use of a local government website, as well as other positive assessments of federal and local governments, in particular. The evidence suggests that e-government can increase process-based trust by improving interactions with citizens and perceptions of responsiveness. The findings are theoretically important for reconciling previous conflicting research on the effects of e-government, and for understanding variations by level of government. Citizen attitudes toward government, including trust, are core concerns for democratic governance and public administration.

Introduction

Does e-government improve citizen attitudes toward government? Can it remedy the problem of declining public trust and confidence in government that has been apparent for more than three decades? According to Norris (2001, 113) “there is widespread concern that the public has lost faith in the performance of the core institutions of representative government, and it is hoped that more open and transparent government and more efficient service delivery could help restore that trust.” E-government, which has been proposed as one solution, “refers to the delivery of [government] information and services online via the Internet or other digital means,” (West 2000, 2) and may also include opportunities for online political participation (Mossberger, Tolbert and Stansbury 2003). E-government holds promise for improved delivery of many types of public services, including online transactions, as well as disseminating information about the operation of government. It can improve communication between citizens and government through email, enabling more direct participation in government decision-making (Thomas and Streib 2003). The purpose of this research is to provide an empirical evaluation of the impact of e-government on citizen attitudes about government.

Reversing the decline in public trust in government is one of the dilemmas of modern governance, and has been the focus of a great deal of theory and research (Levi and Stoker 2000; Nye, Zelikow and King 1997). The problem has also inspired myriad proposals for government reform, including market-based or entrepreneurial reforms that seek to make the administration of government more efficient and effective (National Performance Review 1993; Osborne and Gaebler 1992; Peters 2001, Chapter 2). Other proposals for government reform prescribe increased citizen participation in the political process to counteract declining trust in government (Dryzek 1990; Barber 1984; Fishkin 1993; Bowler, Donovan and Tolbert 1998; Donovan and Bowler 2004). Drawing upon both of these prescriptions for reform, governments and

institutions such as the European Union and United Nations have portrayed e-government as a renewal of the relationships between governments and citizens (Chadwick and May 2003; United Nations 2001, 5).

An early study of e-governance conducted by the Organization for Economic Cooperation and Development (OECD), based on interviews with information specialists, public officials and the policymaking community in eight postindustrial countries found that the “overall impact of the Internet had failed to increase access to policymakers, to improve the transparency of government decision making, or to facilitate public participation in policy making” (cited in Norris 2001, 114). In the seven years since this study was conducted, use of e-government has increased dramatically. The use of government websites is one of the fastest-growing activities on the Internet (Larsen and Rainie 2002), and survey data show that 50 percent of Americans (and 75 percent of Internet users) report experience using e-government (Hart-Teeter 2003). The federal government has a central portal for all federal services (<http://www.firstgov.gov>), and all 50 states have adopted some form of e-government (West 2003a); a recent survey indicates that almost 80% of local governments maintain a website (Norris et al. 2001).

Some survey data suggest that citizen attitudes are influenced by e-government (West 2004; Hart-Teeter 2003; Larsen and Rainie 2002). West (2004) analyzes national survey data (Hart-Teeter 2001) and finds that exposure to information about e-government is significantly related to the opinion that government is effective at solving problems, but is not related to trust in government. The telephone survey offered a description of e-government, and respondents were questioned both before and after the priming. Survey data collected in 2001 by the Pew Internet and American Life Project (Larsen and Rainie 2002) show a greater range of positive attitudes toward government among e-government users, but they do not use multivariate

analysis to control for factors other than e-government use that may influence general attitudes toward government. A two-stage multivariate analysis of the Hart-Teeter 2001 data concluded that e-government users are in fact more likely to trust government as a result of their experiences online (Welch, Hinnant and Moon forthcoming).

Has confidence in government improved as e-government use has increased? Or was the original OECD study correct, and has e-government had little positive effect? This research is an attempt to reconcile and update the previous, conflicting findings on the effects of e-governance on public trust and citizen attitudes about government. Drawing on the 2001 Pew survey data discussed by Larsen and Rainie (2002) we use two-stage multivariate models to test whether e-government users have more positive attitudes toward government, and whether positive attitudes toward transparency and effectiveness, accessibility, and responsiveness are in turn related to more generalized trust. In contrast to Welch, Hinnant and Moon (forthcoming) a unique contribution of this research is to analyze variations among local, state and federal e-government users. We find users of local government websites are more likely to trust local governments, controlling for other demographic factors, and that use of government websites is associated with other positive attitudes, especially for federal and local governments.

Trust in Government

Trust in government slid into a steep decline in the mid-1960s, and has been persistently low ever since, despite short-lived fluctuations, including a temporary respite after the terrorist attacks of September 11, 2001. In 1958 almost three-quarters of people surveyed said they trusted the federal government “to do what is right” most of the time or just about always. Only 40 percent professed this level of confidence in 2002. In 1994, the proportion of the population trusting the federal government reached a century low of 21 percent, and has been hovering around 40 percent since the 1970s (Donovan and Bowler 2004, 17-18).

What is meant by “trust in government,” and why does it matter? According to Miller and Listhaug (1990, 358 cf. Levi and Stoker 2000), trust in government is an evaluation of “whether or not political authorities and institutions are performing in accordance with normative expectations held by the public.” Declining trust has been linked to declines in political participation by some of the leading scholars in the field (Hetherington 1998 and 1999; Norris 1999; Craig 1996), and many consider it no accident that the dramatic decline in turnout rates in America since the 1960s mirrors the decline in political trust (Putnam 2000). Yet trust is only one factor in complex decisions about political participation, and so, its effect has been hard to measure and much-debated (Levi and Stoker 2000). Beyond the question of voting and participation, trust is important for the legitimacy and stability of the political system. Trust in government encourages compliance with laws and regulations (Tyler 1990 and 1998; Levi 1988 and 1997; Ayres and Braithwaite 1992). At the extreme, a lack of trust in governmental institutions undermines rule of law. Most importantly, distrust diminishes the legitimacy of government. High levels of cynicism and distrust are reasons to be concerned about American democracy (Donovan and Bowler 2004, 29; Craig 1993; Putnam 2000).

If trust in government is merely related to citizen evaluations of particular politicians, parties, events, or policies, then citizen disaffection is more episodic, and of lesser concern. Evidence shows that these specific outcome variables do matter for trust (Citrin 1974; Abramson and Finifter 1981; Citrin and Green 1986; Miller and Borrelli 1991; Craig 1993; Orren 1997; Hetherington 1998, 1999; Hibbing and Theiss-Morse 1998). Research has found that voting for losing candidates can generate discontent among voters. If “your” candidate loses, then you aren’t as satisfied with politics as people who vote for the winner (Donovan and Bowler 2004, 31).

Citizens may be making what Easton (1975) has called diffuse judgments about government, rather than specific evaluations of particular administrations or political actors. In a survey of the extensive literature on trust, Levi and Stoker (2000) concluded that “variations in political trust reflect more than incumbent-specific satisfactions or dissatisfactions” or specific historical factors such as the Vietnam War and Watergate (2000, 483). Hypothesized causes for decreased confidence in government are multiple and interrelated, involving many actors and many institutions in society. Possible causes include economic change (Bok 1997), perceptions of performance of government programs (Orren 1997), decreasing social capital (Mansbridge 1997), party polarization (King 1997), and postmaterialist values (Inglehart 1997). Comparing these possible causes of dissatisfaction, Nye (1997) concluded that each of these offered only a partial explanation at best, and that the causes were complex.

Traditionally, scholars have conceptualized trust as a product of citizen preferences regarding outcomes (either policy or electoral outcomes). But preferences and outcomes explain only one part of the dissatisfaction with government, because surveys show that only about 37 percent of Americans with low trust in government say that policies do not reflect their beliefs and values (Nye 1997, 9). Recent research provides evidence that citizens base their evaluations

on *process* considerations as well – how fair, open, and responsive political and governmental processes are (Hibbing and Theiss-Morse 1998, 2001, 2002; Donovan and Bowler 2003; Jiobu and Curry 2001; Miller and Borrelli 1991; Anderson et al. 2005). “Beneath the general distrust of government are specific perceptions that American government [is]...no longer responsive to citizens,” according to Donovan and Bowler (2003, 17). In 2002, only 33 percent of Americans thought that public officials cared about what “people like them” thought, down from 73 percent in 1960. In the 1990s, a majority of Americans agreed with the statement “people like me don’t have any say in what government does” (Donovan and Bowler 2003, 19). Research by Hibbing and Theiss-Morse (1998, 2001, 2002) shows that while citizen preferences fall short of direct democracy, citizens want a more participatory policymaking process than what they perceive is the current operation of American representative government. As these studies show, trust is simply one factor that is usually measured to understand citizen confidence in government. Questions in national surveys such as the National Election Studies have also measured related ideas such as efficacy or responsiveness (government cares about citizens like me) and fairness (whether government serves only certain interests). This study proposes to look at these additional dimensions of citizen attitudes toward government as well.

Causal Mechanisms: E-Government and Trust

How, then, could e-government possibly influence trust in government against this broad backdrop of social forces? How is it that trust relates to what public agencies and administrators do? Government agencies and programs are perceived to be part of the problem. Surveys show that the most common reasons given for low trust in government are perceptions that government is inefficient, wastes money, and spends it on the wrong things (Nye 1997, 18; Baldassare 2000, 12). Norris (1999) argues that politics is increasingly characterized by “critical citizens” who

have heightened expectations of government and low evaluations of the performance of both government agencies and representative institutions (See also Rosenthal 1997).

Thomas (1998) has argued that little research has considered the exact mechanisms through which public institutions can maintain or create trust in government. Much like Hibbing and Theiss-Morse (2002), he concludes that citizen beliefs about the fairness and responsiveness of government processes are important. Two modes for the creation of trust identified by Thomas are significant for e-government: process-based trust, and institutional-based trust (see also Welch, Hinnant and Moon forthcoming). *Process-based trust* is rooted in repeated exchanges or interactions with government. As a result of these interactions, individuals participate in instrumental exchanges and get what they need, but there are also symbolic exchanges. Thomas (1998) asserts that one dimension of trust is based on perceptions that government cares about citizens, their needs, and their expectations – perceptions that government is responsive. *Institutional-based trust* is a judgment of institutions rather interactions, and conveys expectations that institutions will “do what’s right.” Citizens trust institutional expertise or past institutional practice. In many ways, institutional-based trust represents an image held by respondents. Institutional actions that conform to public expectations may enhance an institution’s image or reputation.

E-government has been proposed as a solution for increasing citizen communication with government agencies, and ultimately political trust (Seifert and Peterson 2002; Chadwick and May 2003; West 2004; Ho 2002; Norris 2001; Clift 2000; Thomas and Streib 2003; Tapscott 1997). The literature on e-government identifies two different, but co-existing reform paradigms related to digital “government-to-citizen” relationships. These can be characterized as the entrepreneurial approach and the participatory approach (Chadwick and May 2003; Musso, Weare and Hale 2000; Moon 2002; Mossberger, Tolbert, and Stansbury 2003, 95-96; McNeal et

al. 2003). Both reform paradigms predate the widespread use of e-government, but have embraced the use of the Internet to either modernize government or to promote e-democracy. A summary review of the two approaches to e-government demonstrates that both depict potential benefits that could possibly influence process-based and institutional-based trust.

The Entrepreneurial Approach

The entrepreneurial approach to e-government is closely associated with the idea of “reinventing” government in the U.S., and with “new public management” reforms abroad (Osborne and Gaebler 1992; Chadwick and May 2003; Fountain 2001, 19). The critical task is creating government that is customer-driven and service oriented (National Performance Review 1993; Osborne and Gaebler 1992). Emulation of the private sector is significant for the entrepreneurial model, and the rise of e-commerce clearly influenced later reinvention initiatives (Fountain 2001, 18-20; Chadwick and May 2003). Responsiveness in the entrepreneurial model is represented by quality customer service. The Internet provides a flexible and convenient interface with government customers, who can access government around the clock and experience “one-stop shopping” for information and services. Efficiency is another important value in this model. The single portal creates an atmosphere that is conducive to the interagency and even inter-organizational collaboration that is also part of the reinvention paradigm for enhancing efficiency and effectiveness (Ho 2002; but see Fountain 2001, 201 for discussions of the limitations of integration). E-government has the potential to reduce the cost of service delivery, although the front-end costs of development may mean that cost savings are not immediately realized. This is also consistent with the philosophy that government that “works better, costs less” will increase citizen confidence in government. Indeed, the original federal government report on reinvention, the National Performance Review, identified government waste and inefficiency as reasons underlying current lack of trust in government (National

Performance Review 1993). While customers are concerned with results, their views of the effectiveness of government processes count, too.

The Participatory Approach

Another major model of government reform that has been associated with e-government is the participatory model. To revitalize trust in government, prescriptions range from direct democracy through ballot initiatives and referenda to more transparent representative systems (Dryzek 1990; Barber 1984; Fishkin 1993; Bowler, Donovan and Tolbert 1998; Bowler and Donovan 1998; Donovan and Bowler 2004; Tolbert 2003). Citizen participation and public dialogue are deemed critical for fostering greater government accountability, transparency and responsiveness. Some scholars see information technology as the most important ingredient for creating a more participatory democracy and increasing confidence in government (Toffler 1995; Norris 2001; Bimber 2003; Budge 1996; Rheingold 1993; Grossman 1995). The information capacity available on the Internet allows citizens to become more knowledgeable about government and political issues, and the interactivity of the medium allows for new forms of communication with elected officials and between citizens – through chat rooms, listservs, e-mail, and bulletin board systems. The posting of contact information, legislation, agendas, and policies are all preliminary steps that make government more transparent, enabling informed participation online and offline, while the Internet offers direct channels of communication as well. Clearly, the participatory model addresses the concerns about a fair and open process that Hibbing and Theiss-Morse identified as a source of discontent with government.

While these two paradigms have different emphases, together they suggest that there are six possible benefits of e-government that could lead to increased trust and confidence in government.

Process-based Trust

Citizens may perceive-government as:

- 1) **Responsive**, through improved communication and interactions with citizens. Both websites and e-mail create new opportunities for interaction with officials that are convenient and quick, potentially enhancing responsiveness. By making available information and services that citizens want, and improving the speed and ease of interactions, e-government may be an antidote for the decrease in external efficacy that has paralleled declines in trust. This external efficacy – the judgment that government cares about citizens like me – is clearly related to process-based trust.
- 2) **Accessible**, around the clock, and seven days a week. Single, integrated portals and links to other sites have the potential to make information and services from a number of agencies available to citizens through a single website. Searchable databases and layout can improve the accessibility of information as well. Government online may also feature foreign language translation capabilities and websites that are accessible to people with disabilities. Accessibility may cause greater familiarity with government through more frequent interactions, thereby increasing process-based trust.

Institutional-based Trust

Citizens may perceive e-government as:

- 3) **Transparent**, through the posting of information such as data, policies, laws, meeting schedules and minutes, and contact information. Searchable databases on websites may also make information searches easier for citizens. This transparency makes increased accountability to the public possible, increasing institutional-based trust.
- 4) **Responsible**, as demonstrated by privacy and security statements, and policies for handling personal information submitted online and government data that is posted

online. Such responsibility might encourage citizens to see government as fair and ethical, affecting institutional-based trust.

Process-Based and Institutional-Based Trust

Other aspects of e-government may include both types of trust, as citizens may perceive e-government as:

- 5) ***Efficient and effective***, through the use of the latest technology to automate processes, improve service delivery, produce budget savings, and save time. Online transactions and downloadable forms are examples of more efficient and effective processes through e-government. More generally, however, automation emulates the convenience and efficiency of e-commerce, and so suggests that government is adopting state-of-the-art private sector practices. Individuals may believe that e-government is effective because of their experience in finding the information they want, increasing process-based trust; or they may have a more favorable impression of government in general because of its use of information technology, increasing institutional-based trust.
- 6) ***Participatory***, providing for citizen input. Online town meetings, bulletin board systems, chat rooms, deliberative processes for e-rulemaking, are examples of how this might be realized through e-government. Citizens who are more engaged could increase process-based trust, while others may observe opportunities for participation and experience an increase in their institutional-based trust.

The argument is that the use of government websites may lead to positive attitudes toward e-government, which in turn may encourage improved trust or confidence in government more generally. Before discussing the research design for this study, the next section of this proposal gives a brief overview of the current state of e-government and looks more closely at research by

Mossberger and Tolbert (forthcoming), which tests some of these assumptions and concepts using Pew survey data and two-stage causal modeling.

The Current State of E-Government

In practice, the implementation of e-government varies widely, and not all of these ideal benefits have been realized. The posting of information is most common, with online transactions spreading, but not universally available at the state and local level. For all governments, information and service delivery are more prevalent than participatory opportunities through e-government (see Chadwick and May 2003 on federal policy, West 2003a and West 2003b on state and local government, Norris and Moon 2003 and Musso, Weare and Hale 2000 on local government). Some of the constraints on e-government implementation reflect a lack of experience and capacity, and this is most evident at the local level (Moon 2002; Ho 2002; Norris et al. 2001). Governments have also consciously favored the entrepreneurial paradigm over the participatory one. Research on state implementation of e-government showed that professional networks, legislative professionalization and Republican legislatures were associated with more advanced implementation, but that participatory variables, such as state use of the ballot initiative, were not (McNeal et al. 2003). Similarly, surveys of local officials have found cost savings most frequently cited as the reason for adopting e-government (West 2000).

Survey research shows that citizens turn to government websites for a number of activities, but that looking up information (63 percent) is more common than online transactions (23 percent) or use of the sites for political participation (Hart-Teeter 2003; Larsen and Rainie 2002). Some of this, of course, reflects the configuration of current e-government websites, as well as citizen preferences. About 23 percent have used government websites to research voting records or to get information on voting, even if websites have not generally provided a direct

means of participation online. Thirty percent of e-government users have reported submitting personal information to a government website to obtain a product or service, indicating some level of trust that government will act responsibly with this information. (Hart-Teeter 2003).

Use of government websites also varies across level of government. Most Americans with experience using e-government have used federal government websites (59 percent), but significant proportions have used local (43 percent) and state government websites (54 percent) (Hart-Teeter 2003). African-Americans and women are most likely to use local websites, however (Larsen and Rainie 2002).

What is the evidence that e-government, in its current state, influences citizen attitudes toward government? Two major national surveys have asked respondents whether e-government affects their attitudes toward government, including trust in government. As mentioned, West (2004) found that receiving information about e-government was associated with positive attitudes about government effectiveness, but not trust, while Welch, Hinnant and Moon (forthcoming) have found both positive attitudes and trust using the same data. Using 2001 survey data collected by the Pew Internet and American Life project, we can examine attitudes toward government websites and government, for federal, state, and local levels of government. The Pew survey does not include questions measuring all of the potential benefits of e-government, but it does include questions related to the most common uses of e-government such as information seeking and online interactions. The questions posed can be conceptualized as measures of transparency and effectiveness, accessibility, and responsiveness. Several hypotheses can be tested using this data.

Hypothesis 1: Use of government websites leads to increased perceptions of 1) transparency and effectiveness of government; 2) accessibility of government; and 3) responsiveness of government.

Hypothesis 2: Improved evaluations of government institutions and processes lead to greater trust in government. The causal mechanisms for linking the attitudes in Hypothesis 1 with trust include institutional-based trust and process-based trust. Transparency and effectiveness may be associated with institutional-based trust in particular, because it may enhance the image of government. Perceptions of improved interaction or responsiveness are clearly related to process-based trust.

Another possibility is that e-government may change citizen attitudes because it makes government more *accessible*. Nye (1997, 18) asserts that “The information technology revolution may also help government get closer to people, and when people feel a closer connection to government, confidence tends to be higher.” Trust in government is higher for state and local governments than for the federal government, perhaps in part because of their greater accessibility and familiarity (Thomas 1998). Surveys also show that citizens think more highly of their own representative than of Congress, and that they are more satisfied with their local school than with public education (Nye 1997, 9). Perhaps greater accessibility to government online could also increase trust in government.

Hypothesis 3: Because e-government is more extensive and more sophisticated at the federal level, positive attitudes toward government websites translating into increased trust in government are more likely for the federal government, followed by state government, then local government. If the effects of e-government are due primarily to the potential of the technology rather than particular uses or government attributes, then we could expect that the federal government would be rated most highly by citizens.

Data and Methods: Analysis of 2001 PEW Survey Data

To examine the effect of the use of e-government on citizen attitudes about government we turn to a national random digit-dialed telephone survey conducted by the Pew Internet and American Life Project of 815 people who had reported in previous surveys that they used government websites. This is the first research we are aware of to explore the impact of *use* of e-government on citizen attitudes, rather than information about e-government. The survey was conducted between September 5 and 27, 2001. The Pew survey questions can be used to operationalize perceptions about some of the important benefits of e-government identified earlier: 1) transparency and effectiveness, 2) accessibility and 3) responsiveness and finally 4) trust. We analyze each dependent variable using these data, with separate models for the effects of visiting a government website (federal, state or local) on citizen attitudes about government.

The primary explanatory (or independent) variable measures whether the respondent has visited the website of a government or government agency. Separate questions measure exposure to federal, state and local e-government websites. Each of the three explanatory variables is coded 1 if the respondent has used that type of government website and 0 if otherwise. Based on Thomas' hypothesis that process-based trust is built over time through repeated interactions, we include a control variable for frequency of e-government use ranging from 5 (use e-government every day) to 1 (less often), but this variable does not distinguish between use of e-government at varying levels (federal, state and local), as our primary explanatory variables do. Frequency of e-government use, however, should be important for improving citizen attitudes about government. Analysis (not shown) suggests that endogeneity (or selection bias) is not a significant factor in e-government use.¹

To test the three primary hypotheses laid out above, we propose a two-stage causal model, where exposure to and use of e-government makes government processes, services, policies and information more available to citizens. In turn, improved perceptions of government

transparency and effectiveness, accessibility and responsiveness should translate into increased general trust in government. We expect variations by level of government, with improved trust more likely at the federal level. Therefore, we employ two-stage estimation procedures to test the hypotheses that e-government increases perceptions of government processes and eventually trust. In the first stage we estimate perceptions of 1) government transparency and effectiveness, 2) accessibility and 3) responsiveness as a function of a critical set of independent variables employed in the second stage, as well as frequency of e-government use. To do so, we use a two-stage estimation procedure estimating two-stage models with ordinal dependent variables, in that our models assume an ordered logistic distribution instead of a normal distribution.

We begin this two-stage estimation procedure by estimating the reduced form equations for perceptions of 1) government transparency and effectiveness, 2) accessibility and 3) responsiveness reported in Table 1 through 3. These equations are estimated using ordered logistic regression.² From the reduced-form estimates we produce predicted values for each respondent for the three government process evaluations, each at the federal, state and local government level. We substitute these predicted values for the endogenous variables on the right-hand side of the equation modeling trust in government. We estimate the second stage models (Tables 4 through 6) using ordered logistic regression. The same set of explanatory variables is used in stage 1 and 2 models, with the exception of frequency of e-government use which is used only in stage 1 (instrumental variable). More specifically, the probability of improved perceptions of government transparency and effectiveness ($X_{2,1}$ federal, $X_{2,2}$ state, $X_{2,3}$ local), accessibility ($X_{3,1}$ federal, $X_{3,2}$ state, $X_{3,3}$ local) and responsiveness ($X_{4,1}$ federal, $X_{4,2}$ state, $X_{4,3}$ local) is used to predict trust in the federal government (Y_1), trust in state government (Y_2) and trust in local government (Y_3).

Three primary dependent variables are used in the first stage to test the hypothesis that e-government makes government processes, services, policies and information more available to citizens. The concepts of transparency and effectiveness are operationalized with the question: *“When you go online to government web sites, how often are you able to get information or services you are seeking?”* This variable captures some elements of both transparency and effectiveness, because of the way the question was asked. The dependent variable is coded from 5 (always) to 1 (never) with higher values indicating increased perceptions of transparency. To explore whether e-government may make government information more accessible, accessibility is operationalized with the survey question: *“When you want to get information about...Your federal government or agency, do you find that it is generally very hard, fairly hard, fairly easy, or very easy to find the government web site that you need?”* The dependent variables range from 4 (very easy) to 1 (very hard), with higher values measuring more positive experiences with the usability of e-government. Finally, e-government may improve transactions and communication between citizens and their government. Government responsiveness is operationalized with the survey question: *How much, if at all, has the Internet improved the way you interact with...the federal government?* The dependent variables range from 4 (a lot) to 1 (none at all), with higher values indicating increased responsiveness of government. Identical question wording is used for state and local government questions, but substituting the word federal, with either state or local.

The primary dependent variable in the second stage models is trust in government. The hypothesis is that exposure to and use of e-government leads to improved experience with and perceptions of government processes, and eventually increases citizen trust in government. The classic survey question-- *“How much trust and confidence do you have in ...Our federal government when it comes to handling domestic problems?”* --is used to measure attitudes about

the federal government. The dependent variables range from 4 (a great deal) to 1 (none at all) with higher values indicating more political trust. The same question wording is used to measure trust in state and local government, but substituting the word “state” and “local” for “federal.”

Previous research has shown that while trust in government has decreased for all demographic groups, that some individuals are more likely to trust government than others. African-Americans are more likely to trust government, and trust rises with education. Factors that decrease trust in government include age (King 1997). Partisanship also affects trust, as those who identify with the party controlling the presidency or Congress are more likely to trust the federal government (Donovan and Bowler 2004). Regardless of the party in power, strong partisans are also more likely to trust government, perhaps because of feelings of efficacy and greater identification with the political process (King 1997). Government workers are more likely to trust government, perhaps because their attitudes toward government encouraged them to enter public employment in the first place (Brewer and Sigelman 2002).

To ascertain whether e-government increases trust in government, it is necessary to control for factors that are related to trust or could be hypothesized to influence interest in e-government. The educated, young, affluent, and non-Latinos are those who are statistically most interested in looking up government information online, controlling for other factors. African-Americans and whites do not differ significantly in *interest* in looking up government information online, although technology disparities influence who actually goes online and who does not (Mossberger, Tolbert and Stansbury 2003, 100). Since this sample is composed of those with experience using e-government, variation in the interests of those who are online is most germane to this analysis. Descriptive data from the Pew study shows that African-Americans and women are more likely to use local government websites, although this is based on simple percentages rather than multivariate statistical analysis (Larsen and Rainie 2002).

Individual level explanatory variables included in this analysis measure race, ethnicity, gender, partisanship, income, age and education and whether the respondent is a government employee. “Dummy” variables for African-American, Latino, Democrat, Republican, government worker and males are coded 1 and 0 otherwise. For race and ethnicity, whites were the reference group. For partisanship, those without strong partisan identification – independents – were the reference group. Otherwise, the data available for this survey doesn’t allow measurement of the intensity of partisanship. Females were the reference group for gender (males=1, females=0). Education was measured on an 8-point scale with responses ranging from 1= none, or grades 1-8 to 8= postgraduate training. Income may be related to feelings of trust, as those with higher incomes may be more satisfied with government performance. Economic factors may be related to the decline in trust in government (Lawrence 1997). Income was also measured on an eight-point scale with 8= more than \$100,000 and 1= less than \$10,000. Age was measured in years.

Results

Stage 1

Since the dependent variables measuring the concepts of transparency, accessibility and responsiveness are ordinal, ordered logistic regression is used to predict the impact of use of e-government on citizen attitudes. Table 1 explores whether e-government affects citizen attitudes about the transparency or effectiveness of government, with separate statistical models for the federal, state and local government levels. Column 1 shows that visiting a federal government website is statistically related to increased perceptions of the transparency of government, even after controlling for other demographic, economic and attitudinal factors. Individuals who reported using federal e-government websites were more likely to report finding the government

information or services they were seeking. However, visiting a state or local government website was not related to an increased probability of finding relevant government information or services. This suggests that federal e-government sites may increase perceptions of transparency, if not overall levels of political trust.

[Table 1 here]

The substantive magnitude of the effect of visiting a federal government website on attitudes about the transparency of government is non-trivial. To simulate the predicted probability of improved evaluations of government transparency the ordered logit coefficient for e-government use from Table 1 (column 1) was converted to predicted probabilities. We varied whether or not the respondent had used a federal government website, setting values for age, income, education and frequency of e-government use at their means. Binary variables were held constant at their modal category, so for the simulation the respondent was assumed to be female, white non-Hispanic, without strong partisanship (independent) and a non-government employee.³ Holding the other explanatory variables constant (described above), a respondent who had not visited a federal government website had a 14 percent probability of answering that he or she would “always” “get the information or services you are seeking,” “when you go online to government web sites.” This probability increased to 22 percent for the same respondent who had used federal e-government websites, a difference of 8 percent based on experience with e-government alone.

Improved accessibility is another way that e-government might affect citizens. Table 2 explores whether visiting a federal, state, or local government website affects one's ability to find information from the government or agency. The analysis shows that visiting a federal or local government website statistically increases the perceived ease of finding information. Individuals who use federal and/or local government websites are more likely to report that is easy (or very easy) to find the government web site they need. This positive statistical relationship holds after controlling for other demographic factors, such as age, gender, race, ethnicity, income, education and employment and frequency of use. Interestingly, visiting a state government website does not produce perceptions of accessibility.

[Table 2 here]

Table 3 reports on whether e-government increases perceptions of government responsiveness. The data indicates that visiting a federal, state, or local government website statistically increases the perceived responsiveness of government, *ceteris paribus*. Citizens using websites for *any* level of government were more likely to say that the Internet has improved their interaction with government at that level. Probability simulations indicate the effect of local e-government use has a dramatic effect on perceptions of local government responsiveness (column 3). Setting the explanatory variables at their means or modes (for binary variables) as discussed earlier, a respondent who has not visited a local government website has only a 3 percent probability of indicating that the Internet has significantly improved (“a lot”) interaction with local government. This probability increases to 19 percent for the same

individual who has used local e-government websites, *ceteris paribus*. Among non e-government users at the local level, there is only a 9 percent probability of indicating that the Internet has “somewhat” improved interaction with local government. This probability increases to 29 percent among local e-government users, a 20 percentage point difference based on use of local e-government websites alone.

[Table 3 here]

In summary, visiting a federal website was statistically related to citizen perceptions of transparency of government, accessibility of government information and increased responsiveness of the federal government. Visiting a local government website was associated with citizen perceptions of accessibility and responsiveness of local government. Visiting a state government website was statistically associated with only increased perceptions of responsiveness of state government.

[Summary table for stage 1 here]

Stage 2

Do improved attitudes about government processes translate into increased general trust in government? If so, e-government could be a powerful mechanism for the development of process-based trust. Since the dependent variables in the stage 2 models measuring the concept

of trust in government at the federal, state and local levels are ordinal, ordered logistic regression coefficients are again reported. In Table 4 we see that while Republicans tend to have more trust in the federal and state government (likely reflecting partisan control of government at the time of the survey), individuals with improved perceptions of government transparency via use of federal, state or local government websites were *not* statistically more likely to trust their federal, state or local government. Thus while visiting a federal government website did appear to increase perceptions of federal government transparency, this does not appear to lead to more trust in federal government institutions. This is important, showing the limitations of e-government on citizen attitudes.

[Table 4 here]

Table 5 repeats the null findings above. Republicans and the young are more likely to express trust in government at all levels than Democrats and Independents and older respondents, consistent with the published literature. Among e-government users, Latinos are less likely than others to trust local government. But, respondents with improved perceptions of government accessibility through use of federal, state or local e-government websites were not more likely to trust the government at any level. In fact, we find improved perceptions of local government accessibility resulted in reduced trust in local government. This null finding is noteworthy, given that use of federal and local government websites were linked to perceptions of government accessibility at the federal and local levels in the models reported in Table 2. The fact that ease of finding a government web site is negatively related to trust in government indicates that

perhaps this variable is measuring something that is conceptually different than the other questions. Accessibility is more directly an evaluation of the e-government websites, rather than government in general. Finding a government web site demonstrates technical proficiency in organizing the sites rather than government intent to be open or responsive. Again, e-government appears to improve perceptions of government processes, but not trust.

[Table 5 here]

Finally, Table 6 explores whether perceptions of government responsiveness translate into government trust. Controlling for other factors, improved perceptions of government responsiveness at the federal or state levels does not appear to increase trust in those governments. But interestingly, improved perceptions of *local* government responsiveness (via local government website use) *is* statistically related to increased trust in local government, even after controlling for other demographic, economic and attitudinal factors. Probability simulations based on the coefficient for the predicted value in Table 6 (column 3) reveals a significant impact of evaluations of government responsiveness on general trust in government. Holding the explanatory variables at their means or modal category (for binary variables) reveals that a respondent with low (minimum) perceptions of local government responsiveness has a 12 percent probability of trusting local government “a great deal.” This increases to a 15 percent probability if the respondent has average (mean) evaluations of government responsiveness and a 24 percent probability of trust if she or he has high (maximum) evaluations of local government

responsiveness. Varying evaluations of local government responsiveness from low to high increases trust in local government by 12 percent, all else equal.

[Table 6 here]

In the nine relationships tested in this second stage analysis, only one, perceptions of government responsiveness at the local level—leads to greater trust in local government. This suggests that the local level is important in terms of studying the effects of e-government on citizens.

[Summary table for stage 2 here]

The statistical analysis provides some support for our primary hypotheses. Use of government websites does appear to lead to increased perceptions of government transparency and effectiveness, accessibility and responsiveness, although to varying degrees, depending on the level of government. As we hypothesized, use of federal government websites appears to have the greatest positive effect on citizen attitudes toward government processes. We find only limited support for our second hypothesis, but important support nevertheless. Experience with local e-government does appear to have beneficial effects on citizen attitudes about government responsiveness, that in turn result in improved general trust in local government. Based on this

analysis, federal and local e-government sites appear to be the most fruitful venues for future study, given the more positive attitudes that citizens demonstrated in response to these sites.

Conclusion

Digital government has attracted attention as one way of improving citizen interactions with government because of the dilemmas that citizen apathy and distrust pose for democracy. There is currently a shortage of empirical information about whether e-government in fact influences citizen attitudes about government, and if it does have some effect, how or why it matters.

Analysis of Pew survey data reveals visiting a local government website leads to enhanced trust in local government, controlling for other attitudinal and demographic factors. E-government at the local level is also perceived by citizens to make government accessible and responsive, but it is only responsiveness that is directly linked to increased trust of local government in the two-stage model. This suggests that increased government trust is produced by improved interactions through e-government at the local level. The federal government rates highest on positive attitudes about government processes. This likely reflects the wider use and greater technical capacity of digital government at the federal level. Yet, these advantages do not lead to greater trust. For the federal and state government, trust among e-government users is a function of other factors such as age, partisanship, gender, and ethnicity. More frequent use of e-government is also associated with more positive attitudes toward government processes in many of the models. Despite the limited findings in terms of trust, it is good news that citizens see digital government in a positive light.

What are likely reasons for use of e-government and responsiveness producing greater trust at the local level? Local government websites are often the least technically proficient.

Perhaps it is the nature of local government and its proximity to citizens that leads them to place greater value on improved interactions with local government. The information and services available on local government websites may be especially valuable for citizen's daily routines, such as mass transit, local services, or neighborhood information. Alternatively, the results may reflect a negative judgment of federal government. Distrust of federal government may be so high that even more positive attitudes toward e-government at that level do not influence these more generalized feelings.

Theoretically, the research finds support for hypotheses about process-based trust that were advanced by Thomas (1998), but that have not been extensively tested. The fact that improved evaluations of government responsiveness appear to lead to increased trust in local government appear to be driven by process, rather than institutional, factors. Citizen attitudes related to institutional trust, such as government transparency, did not lead to increased trust in government at any level. This analysis extends previous research on process and trust (Hibbing and Theiss-Morse 1998, 2001, 2002) by measuring responses to actual changes in process. It suggests future research on e-government should continue to explore process-based trust, and that this may be more significant than has previously been recognized in the scholarship on trust.

What guidance does this offer for government agencies and their managers? The generally positive perceptions indicate that e-government is worth pursuing as a means of enhancing the effectiveness of government agencies and their relationships with citizens. Improved interactions with citizens are the most widely-perceived benefit across all three levels of government, and are also the only variable associated with higher levels of trust. Interaction through online transactions, e-mail, or question services may be especially important for increasing process-based trust. Improving interactions could also include an expansion of

participatory opportunities online, such as online chats or bulletin boards for commentary. E-government has not provided many venues for citizen participation.

There are also some limitations of current survey research for understanding what the potential of e-government might be in building better relationships with citizens. We can say with confidence that e-government leads to positive attitudes among current users, but would that be true if the e-government users were a more diverse group? Currently half of the American population has used a government website. What would be the impact if access to and knowledge about e-government were more widespread? Because of disparities in information technology access and use, which are patterned by race, ethnicity, income, education and age, there are some limitations for generalizing these findings to all Americans. Still, even citizens who are not currently Internet users say that they would be interested in looking up information on a government website, as 78 percent of Americans express interest in doing so (Mossberger, Tolbert and Stansbury 2003, 98). If e-government leads to better relations between citizens and government, this lends even more credibility to policies designed to encourage more widespread use of the Internet through public access and use of technology in schools.

Notes

1. Very few demographic or attitudinal factors are statistically related to use of federal, state or local e-government websites. The more educated are statistically more likely to have visited a federal government website, government workers are more likely to visit a state government website and African Americans are more likely to have visited a local government website. Beyond these limited factors, gender, age, income, race, ethnicity, partisanship and frequency of use provide no explanatory power in predicting e-government use. These logistics regression models predicting e-government use based on the demographic, economic and attitudinal factors provide little explanatory power with very low explained variance (pseudo R-squares range from .02 to .04).

2. As with any two-stage model, we made some identification assumptions in the structural models. We hypothesized that demographic factors, such as race, ethnicity, age, education and income would affect citizen satisfaction with e-government. Frequent users of e-government should be more likely to perceive improved government transparency, accessibility and responsiveness, and the same for government workers who presumably use e-government more frequently. Partisanship may also shape perceptions of government processes. Since Republicans control the presidency and Congress at the time of the survey, we should expect Republican partisans to have more favorable views of government. To simplify the calculation of predicted probabilities, the predicted probabilities reported in Tables 4-6 were based on first-stage Poisson regression models, rather than ordered logistic regression models, as reported in Tables 1-3. This resulted in one overall prediction (or value) per respondent, rather than

predicted values for low, moderate and high evaluations of government transparency and efficiency, accessibility and responsiveness.

3. Estimations were produced using Clarify: Software for the Interpreting and Presenting Statistical Results by Michael Tomz, Jason Wittenberg, and Gary King.

Table 1. E-government Use and Government Transparency or Effectiveness

First Stage Estimates

Variables	Are you able to get information or services you are seeking online?		Are you able to get information or services you are seeking online?		Are you able to get information or services you are seeking online?	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Visited federal government website	.57 (.22)	.012				
Visited state government website			.02 (.22)	.942		
Visited local government website					-.18 (.18)	.309
Employed by the Government	.01 (.20)	.962	-.01 (.20)	.951	-.03 (.20)	.881
Frequency of Use	.11 (.08)	.152	.13 (.08)	.103	.13 (.08)	.090
African American	.02 (.39)	.957	.03 (.40)	.935	.08 (.39)	.847
Latino	-.28 (.38)	.464	-.26 (.38)	.489	-.27 (.38)	.483
Democrat	-.25 (.21)	.243	-.24 (.21)	.252	-.23 (.21)	.282
Republican	-.01 (.21)	.969	-.00 (.21)	.991	-.02 (.21)	.921
Age	.02 (.01)	.062	.02 (.01)	.062	.01 (.01)	.083
Education	.07 (.07)	.298	.10 (.07)	.155	.09 (.07)	.189
Income	-.05 (.06)	.358	-.05 (.06)	.383	-.04 (.06)	.471
Male	.02 (.18)	.924	.04 (.18)	.831	.05 (.18)	.781
Cut1	-3.85 (.78)		-4.04 (.79)		-4.16 (.78)	
Cut2	-1.91 (.57)		-2.11 (.58)		-2.22 (.58)	
Cut3	.03 (.54)		-.19 (.55)		-.31 (.54)	
Cut4	2.90 (.56)		2.65 (.57)		2.54 (.56)	
N	552		548		550	
LR Chi2	16.59	.1206	10.44	.4916	10.74	.4651
Pseudo R2	.0142		.0090		.0093	

Source: Survey conducted by the Pew Internet and American Life Project (reported entitled--“The rise of the e-citizen: How people use government agencies’ web sites,” April 3, 2002) of 815 people who had reported in previous Pew surveys that they used government websites. The random digit-dialed national survey was conducted between September 5 and 27, 2001, N=855. Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

Table 2. E-government use and Government Accessibility

First Stage Estimates

Variables	Generally very easy to find the federal government web site that you need?		Generally very easy to find the state government web site that you need?		Generally very easy to find the local government web site that you need?	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Visited federal government website	.77 (.25)	.002				
Visited state government website			.26 (.26)	.320		
Visited local government website					.70 (.22)	.001
Employed by the Government	.17 (.21)	.413	.36 (.22)	.095	.21 (.24)	.370
Frequency of Use	.01 (.08)	.903	.16 (.08)	.053	-.07 (.09)	.458
African American	.04 (.41)	.931	-.21 (.46)	.644	-.01 (.45)	.988
Latino	-.47 (.39)	.235	.26 (.43)	.537	.28 (.43)	.513
Democrat	.22 (.23)	.327	.04 (.23)	.873	.13 (.25)	.614
Republican	.03 (.23)	.900	-.11 (.23)	.637	-.20 (.25)	.433
Age	-.01 (.01)	.240	-.00 (.01)	.633	-.03 (.01)	.014
Education	.04 (.07)	.592	.02 (.08)	.834	-.13 (.08)	.136
Income	.00 (.06)	.956	-.02 (.06)	.723	.09 (.06)	.189
Male	.02 (.19)	.901	-.22 (.19)	.264	-.22 (.21)	.296
Cut1	-2.89 (.65)		-3.31 (.67)		-3.68 (.67)	
Cut2	-.75 (.60)		-1.02 (.62)		-1.92 (.64)	
Cut3	2.49 (.61)		2.16 (.62)		.96 (.64)	
N	514		497		374	
LR Chi2	14.59	.2021	13.04	.2907	22.75	.0192
Pseudo R2	.0147		.0137		.0273	

Source: Survey conducted by the Pew Internet and American Life Project (reported entitled--"The rise of the e-citizen: How people use government agencies' web sites," April 3, 2002) of 815 people who had reported in previous Pew surveys that they used government websites. The random digit-dialed national survey was conducted between September 5 and 27, 2001, N=855. Statistical analysis by the authors. Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

Table 3. E-government use and Government Responsiveness/Communication
First Stage Estimates

Variables	Improved interaction with the federal government		Improved interaction with the state government		Improved interaction with the local government	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Visited federal government website	1.16 (.21)	.000				
Visited state government website			1.55 (.22)	.000		
Visited local government website					1.90 (.19)	.000
Employed by the Government	.05 (.18)	.799	.13 (.18)	.484	-.05 (.20)	.819
Frequency of Use	.24 (.07)	.001	.36 (.07)	.000	.11 (.08)	.185
African American	-.26 (.35)	.458	.09 (.37)	.811	.20 (.37)	.582
Latino	-.06 (.36)	.867	.14 (.36)	.709	-.41 (.39)	.295
Democrat	.29 (.20)	.146	.20 (.20)	.307	.34 (.22)	.129
Republican	.16 (.19)	.400	.11 (.20)	.583	.09 (.22)	.693
Age	-.02 (.01)	.040	-.01 (.01)	.326	-.01 (.01)	.047
Education	-.00 (.07)	.969	.10 (.07)	.131	.01 (.07)	.906
Income	.10 (.05)	.049	-.02 (.05)	.694	.04 (.06)	.423
Male	-.02 (.17)	.901	-.09 (.17)	.588	-.02 (.18)	.933
Cut1	.32 (.50)		1.11 (.53)		.82 (.55)	
Cut2	1.50 (.51)		2.58 (.54)		1.83 (.56)	
Cut3	3.05 (.52)		3.98 (.55)		3.21 (.57)	
N	543		537		529	
LR Chi2	61.44	.0000	94.65	.0000	140.84	.0000
Pseudo R2	.0411		.0640		.1093	

Source: Survey conducted by the Pew Internet and American Life Project (reported entitled--"The rise of the e-citizen: How people use government agencies' web sites," April 3, 2002) of 815 people who had reported in previous Pew surveys that they used government websites. The random digit-dialed national survey was conducted between September 5 and 27, 2001, N=855. Statistical analysis by the authors. Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

Summary of Stage 1 Findings

	Improved Government Transparency/Effectiveness	Improved Government Accessibility	Improved Government Responsiveness
Visited Federal Government Website	√	√	√
Visited State Government Website			√
Visited Local Government Website		√	√

Table 4. Does Improved Government Transparency lead to Trust in the Government?

Second Stage Estimates

Variables	Do you trust the federal government?		Do you trust the state government?		Do you trust the local government?	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Improved Government Transparency via <i>federal</i> website (predicted probability) ¹	-.05 (.76)	.944				
Improved Government Transparency via <i>state</i> website (predicted probability) ²			-.29 (.1.18)	.802		
Improved Government Transparency via <i>local</i> website (predicted probability) ³					.32 (1.20)	.788
Employed by the Government	.23 (.19)	.240	-.10 (.20)	.598	.20 (.20)	.314
African American	.16 (.39)	.652	.46 (.41)	.255	.07 (.38)	.845
Latino	-.41 (.38)	.281	-.36 (.40)	.367	-.88 (.39)	.024
Democrat	.11 (.21)	.598	.31 (.23)	.174	.14 (.23)	.530
Republican	.64 (.21)	.003	.65 (.21)	.002	.01 (.21)	.978
Age	-.01 (.01)	.106	-.01 (.01)	.357	-.00 (.01)	.584
Education	-.03 (.06)	.660	.03 (.08)	.694	.04 (.08)	.659
Income	.01 (.06)	.797	-.04 (.06)	.493	-.04 (.06)	.529
Male	.32 (.18)	.076	.00 (.18)	.988	.18 (.18)	.323
Cut1	-3.44 (2.82)		-4.51 (4.29)		-1.67 (4.38)	
Cut2	-1.47 (2.81)		-2.27 (4.29)		-.06 (4.37)	
Cut3	1.30 (2.81)		.63 (4.28)		2.69 (4.38)	
N	541		543		540	
LR Chi2	18.10	.0533	14.29	.1601	10.20	.4232
Pseudo R2	.0154		.0125		.0086	

Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

¹ The predicted probability of government transparency was constructed from a Poisson regression model where perceptions of improved government transparency was the dependent variable and independent variables included visiting a federal government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 1.

² The predicted probability of government transparency was constructed from a Poisson regression model where perceptions of improved government transparency was the dependent variable and independent variables included visiting a state government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 1.

³ The predicted probability of government transparency was constructed from a Poisson regression model where perceptions of improved government transparency was the dependent variable and independent variables included visiting a local government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 1.

Table 5. Does Improved Government Accessibility lead to Trust in Government?

Second Stage Estimates

Variables	Do you trust the federal government?		Do you trust the state government?		Do you trust the local government?	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Improved Government Accessibility via <i>federal</i> website (predicted probability) ¹	.25 (.81)	.756				
Improved Government Accessibility via <i>state</i> website (predicted probability) ²			.06 (1.18)	.963		
Improved Government Accessibility via <i>local</i> website (predicted probability) ³					-1.66 (.63)	.008
Employed by the Government	.24 (.20)	.225	-.10 (.25)	.680	.07 (.20)	.729
African American	.18 (.39)	.645	.46 (.41)	.259	-.05 (.39)	.904
Latino	-.44 (.37)	.254	-.32 (.39)	.410	-1.07 (.36)	.003
Democrat	.14 (.22)	.526	.33 (.21)	.119	-.04 (.22)	.864
Republican	.65 (.22)	.003	.65 (.21)	.002	.11 (.21)	.606
Age	-.02 (.01)	.084	-.01 (.01)	.224	.01 (.01)	.314
Education	-.03 (.07)	.694	.02 (.07)	.758	.12 (.07)	.106
Income	.02 (.06)	.759	-.04 (.06)	.523	-.08 (.06)	.167
Male	.32 (.18)	.069	-.01 (.20)	.949	.38 (.19)	.045
Cut1	-2.70 (1.85)		-3.33 (2.45)		-5.76 (1.23)	
Cut2	-.73 (1.85)		-1.09 (2.45)		-4.14 (1.22)	
Cut3	2.05 (1.85)		1.81 (2.45)		-1.36 (1.20)	
N	541		543		540	
LR Chi2	18.19	.0518	14.23	.1627	17.26	.0689
Pseudo R2	.0154		.0125		.0145	

Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

¹The predicted probability of government accessibility was constructed from a Poisson regression model where perceptions of improved federal government accessibility was the dependent variable and independent variables included visiting a federal government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 2.

²The predicted probability of government accessibility was constructed from a Poisson regression model where perceptions of improved state government accessibility was the dependent variable and independent variables included visiting a state government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 2.

³The predicted probability of government accessibility was constructed from a Poisson regression model where perceptions of improved local government accessibility was the dependent variable and independent variables included visiting a local government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 2.

Table 6. Does Improved Government Responsiveness lead to Trust in Government?

Second Stage Estimates

Variables	Do you trust the federal government?		Do you trust the state government?		Do you trust the local government?	
	β (se)	p> z	β (se)	p> z	β (se)	p> z
Improved Government Responsiveness via <i>federal</i> website (predicted probability) ¹	-.04 (.27)	.890				
Improved Government Responsiveness via <i>state</i> website (predicted probability) ²			-.04 (.21)	.834		
Improved Government Responsiveness via <i>local</i> website (predicted probability) ³					.49 (.18)	.006
Employed by the Government	.22 (.19)	.238	-.10 (.20)	.599	.20 (.19)	.315
African American	.17 (.39)	.661	.47 (.40)	.248	-.10 (.39)	.798
Latino	-.40 (.36)	.269	-.32 (.37)	.381	-.86 (.35)	.015
Democrat	.13 (.22)	.565	.34 (.21)	.111	.03 (.22)	.897
Republican	.64 (.21)	.003	.64 (.21)	.002	-.06 (.21)	.776
Age	-.01 (.01)	.090	-.01 (.01)	.212	-.00 (.01)	.979
Education	-.03 (.07)	.625	.02 (.07)	.735	.05 (.07)	.434
Income	.02 (.06)	.763	-.04 (.06)	.524	-.05 (.06)	.317
Male	.31 (.18)	.073	-.00 (.18)	.954	.19 (.18)	.283
Cut1	-3.32 (.81)		-3.54 (.71)		-1.78 (.66)	
Cut2	-1.36 (.78)		-1.30 (.68)		-.16 (.64)	
Cut3	1.41 (.18)		1.61 (.68)		2.63 (.66)	
N	541		543		540	
LR Chi2	18.12	.0530	14.27	.01609	17.91	.0565
Pseudo R2	.0154		.0125		.0151	

Unstandardized ordered logistic regression coefficients, standard errors in parentheses; probabilities based on 2-tailed test. Statistically significant coefficients at more than a 90% confidence interval in bold.

¹The predicted probability of government responsiveness was constructed from a Poisson regression model where perceptions of improved federal government responsiveness was the dependent variable and independent variables included visiting a federal government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 3.

²The predicted probability of government responsiveness was constructed from a Poisson regression model where perceptions of improved state government responsiveness was the dependent variable and independent variables included visiting a state government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 3.

³The predicted probability of government responsiveness was constructed from a Poisson regression model where perceptions of improved local government responsiveness was the dependent variable and independent variables included visiting a local government website, male, age, education, income, African American, Latino, government worker, Democratic and Republican partisans, and frequency of Internet use. The same set of variables as in Table 3.

Summary of Stage 2 Findings

	Trust Federal Government	Trust State Government	Trust Local Government
Improved Government Transparency/Effectiveness			
Improved Government Accessibility			
Improved Government Responsiveness			√

References

- Abramson, Paul R. and Ada W. Finifter. 1981. On the Meaning of Political Trust: New Evidence from Items Introduced in 1978. *American Journal of Political Science* 25 (2): 297-307.
- Anderson, C., Andre Blais, Shaun Bowler, Todd Donovan and Ola Listhaug. 2005. *Loser's Consent: Elections and Democratic Legitimacy*. Oxford: Oxford University Press. In press.
- Ayres, Ian. and John Braithwaite 1992. *Responsive Regulation*. Oxford: Oxford University Press.
- Baldassare, Marc. 2000. *California in the New Millennium: The Changing Social and Political Landscape*. Berkeley: University of California Press.
- Barber, Benjamin. 1984. *Strong Democracy*. Berkeley: University of California Press.
- Bimber, Bruce. 2003. *Information and American Democracy: Technology in the Evolution of Political Power*. Cambridge University Press.
- Bok, Derek. 1997. Measuring the performance of government. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 55-76. Cambridge, MA: Harvard University Press.
- Bowler, Shaun, Todd Donovan and Caroline Tolbert, eds. 1998. *Citizens as Legislators: Direct Democracy in the United States*. Columbus: Ohio State University Press.
- Brewer, Paul R. and Lee Sigelman. 2002. Trust in Government: Personal Ties that Bind? *Social Science Quarterly* 83(2): 626-31.
- Budge, Ian. 1996. *The New Challenge of Direct Democracy*. Cambridge: Blackwell Publishers.
- Chadwick, Andrew and Christopher May. 2003. Interaction between States and Citizens in the Age of the Internet: "E-government" in the United States, Britain, and the European Union. *Governance: An International Journal of Policy, Administration, and Institutions* 16(2): 271-300.
- Citrin, Jack. 1974. Comment: The Political Relevance of Trust in Government. *American Political Science Review* 68 (3): 973-88.

- Citrin, Jack. and Donald P. Green. 1986. Presidential Leadership and the Resurgence of Trust in Government. *British Journal of Political Science* 16 (4): 431-53.
- Clift, Steven. 2000. The E-democracy E-book: Democracy is Online 2.0. Available [online]: www.e-democracy.org.do [12 January 2002].
- Craig, Stephen C. 1993. *The Malevolent Leaders: Popular Discontent in America*. Boulder, CO: Westview Press.
- Craig, Stephen C. 1996. The Angry Voter: Politics and Popular Discontent in the 1990s. in *Broken Contract: Changing Relationships between Americans and their Government*, ed. Stephen C. Craig, 46-66. Boulder, CO: Westview Press.
- Dalton, Russell J. 1984. Cognitive Mobilization and Partisan Dealignment in Advanced Industrial Democracies. *Journal of Politics* 46 (1): 264-84.
- Donovan, Todd and Shaun Bowler. 2003. *Reforming the Republic: Democratic Institutions for the New America*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Dryzek, John S. 1990. *Discursive Democracy: Politics, Policy, and Political Science*. Cambridge: Cambridge University Press.
- Easton, David. 1975. A Re-assessment of the Concept of Political Support. *British Journal of Political Science* 5 (4): 435-57.
- Fishkin, James S. 1993. *Democracy and Deliberation*. New Haven: Yale University Press.
- Fountain, Jane E. 2001. *Building the Virtual State: Information Technology and Institutional Change*. Washington, D.C.: Brookings Institution.
- Grossman, Lawrence K. 1995. *The Electronic Commonwealth*. New York: Penguin.
- Hart-Teeter. 2000. E-government: The Next American Revolution. Prepared for the Council for Excellence in Government. Available [online]: www.excelgov.org [5 December 2001].

- Hart-Teeter. 2003. The New E-government Equation: Ease, Engagement, Privacy and Protection. Prepared for the Council for Excellence in Government. Available [online]: www.excelgov.org.
- Hetherington, Marc J. 1998. The Political Relevance of Political Trust. *American Political Science Review* 92 (4): 791-808.
- Hetherington, Marc J. 1999. The Effect of Political Trust on the Presidential Vote, 1968-96. *American Political Science Review* 93 (2): 311-26.
- Hibbing, John R. and ElizabethTheiss-Morse. 1998. Too Much of a Good Thing: More Representative is Not Necessarily Better. *PS-Political Science and Politics* 31(1): 28-31.
- Hibbing, John R. and ElizabethTheiss-Morse. 2001. Process Preferences and American Politics: What the People Want Government To Be. *American Political Science Review* 95(1): 145-53.
- Hibbing, John R. and ElizabethTheiss-Morse. 2002. *Stealth Democracy: Americans' Beliefs about How Government Should Work*. Cambridge University Press.
- Ho, Alfred Tat-Kei. 2002. Reinventing Local Governments and the E-government Initiative. *Public Administration Review* 62(4): 434-44.
- Inglehart, Ronald. 2000. Globalization and Postmodern Values. *The Washington Quarterly* 23(1): 215-18.
- Inglehart, Ronald. 1997. Postmaterialist Values and the Erosion of Institutional Authority. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 217-36. Cambridge, MA: Harvard University Press.
- Jiobu, Robert M. and Timothy J. Curry. 2001. Lack of Confidence in the Federal Government and the Ownership of Rirearms. *Social Science Quarterly* 82(1): 77-88.
- King, David C. 1997. The polarization of American parties and mistrust in government. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 155-78. Cambridge, MA: Harvard University Press.

- Lawrence, Robert Z. 1997. Is It Really the Economy, Stupid? In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 111-32. Cambridge, MA: Harvard University Press.
- Larsen, Elaine and Lee Rainie. 2002. The Rise of the E-citizen: How People Use Government Agencies' Web Sites. Pew Internet and American Life Project. Available [online]: www.pewinternet.org/reports/pdfs/PIP_Govt_Website_Rpt.pdf [15 August 2002].
- Levi, Margaret. 1988. *Of Rule and Revenue*. Berkeley: University of California Press.
- Levi, Margaret. 1997. *Consent, Dissent and Patriotism*. New York: Cambridge University Press.
- Levi, Margaret and Laura Stoker. 2000. Political Trust and Trustworthiness. *Annual Review of Political Science* 3: 475-507.
- Mansbridge, Jane. 1997. Social and Cultural Causes of Dissatisfaction with U.S. Government. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 133-53. Cambridge, MA: Harvard University Press.
- McNeal, Ramona, Caroline Tolbert, Karen Mossberger, and Lisa Dotterweich. 2003. Innovating in Digital Government in the American States. *Social Science Quarterly* 84 (1): 52-70.
- Miller, Arthur H. and Stephen Borrelli. 1991. Confidence in Government during the 1980s. *American Political Quarterly* 19 (2): 147-73.
- Miller, Arthur H. and Ola Listhaug. 1990. Political Parties and Confidence in Government: A Comparison of Norway, Sweden and the United States. *British Journal of Political Science* 20 (3): 357-86.
- Moon, M.Jae. 2002. The Evolution of E-government among Municipalities: Rhetoric or Reality? *Public Administration Review* 62(4): 424-33.
- Mossberger, Karen, Caroline Tolbert and Mary Stansbury. 2003. *Virtual Inequality: Beyond the Digital Divide*. Washington, D.C.: Georgetown University Press.

- Musso, Juliet, Christopher Weare, and Matt Hale. 2000. Designing Web Technologies for Local Governance Reform: Good Management for Good Democracy? *Political Communication* 17(1): 1-19.
- National Performance Review. 1993. From Red Tape to Results: Creating a Government that Works Better and Costs Less. Washington, D.C.: Government Printing Office.
- Nevitte, Neil and Mebs Kanji. 2003. Authority Orientations and Political Support: A Cross-national Analysis of Satisfaction with Governments and Democracy. *Comparative Sociology* 1 (3-4): 387-412.
- Norris, Donald F., Patricia D. Fletcher, and Stephen Holden. 2001. Is Your Local Government Plugged In? Highlights of the 2000 Electronic Government Survey. Prepared for the International City/County Management Association and Public Technology, Inc. Available [online]: www.umbc.edu/mipar/final_draft/PDFs/e-gov.icma.final-4-25-01.pdf [10 June 2002].
- Norris, Donald F. and M.Jae Moon. 2003. Electronic Government at the American Grassroots – 2002. Available [online]: <http://www.dgrc.org/dgo2003/cdrom/PAPERS/citsgovt/norris.pdf>. [4 January 2004].
- Norris, Pippa. 1999. *Critical Citizens: Global Support for Democratic Governance*. Oxford: Oxford University Press.
- Norris, Pippa. 2002. *Digital Divide: Civic Engagement, Information Poverty, and the Internet Worldwide*. New York: Cambridge University Press.
- Nye, Joseph S., Jr. 1997. Introduction: The Decline of Confidence in Government. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 1-18. Cambridge, MA: Harvard University Press.
- Nye, Joseph S., Jr., Phillip D. Zelikow, and David C. King, eds. *Why People Don't Trust Government*. Cambridge, MA: Harvard University Press.

- Orren, Gary. 1997. Fall from Grace: The Public's Loss of Faith in Government. In *Why People Don't Trust Government*, Joseph S. Nye, Jr., Phillip D. Zelikow, and David C. King, eds., 77-108. Cambridge, MA: Harvard University Press.
- Osborne, David and Ted Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading, MA: Addison-Wesley.
- Peters, B.Guy. 2001. *The Future of Governing: Four Emerging Models*, 2nd ed. Lawrence: University Press of Kansas.
- Putnam, Robert. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.
- Rheingold, Howard. 1993. *The Virtual community: Homesteading on the Electronic Frontier*. Reading, MA: Addison-Wesley.
- Rosenthal, Alan. 1997. *The Decline of Representative Democracy*. Washington, D.C.: CQ Press.
- Seifert, Jeffrey and R. Eric Peterson. 2002. The Promise of All Things E? Expectations and Challenges of Emergent Electronic Government. *Perspectives on Global Development and Technology* 1(2): 193-212.
- Sigelman, Lee, Carol K. Sigelman and Barbara J. Walkosz. 1992. The Public and the Paradox of Leadership: An Experimental Analysis. *American Journal of Political Science* 36 (2): 366-85.
- Tapscott, Donald. 1997. The Digital Media and the Reinvention of Government. *Canadian Public Administration* 40(2): 328-45.
- Thomas, Craig W. 1998. Maintaining and Restoring Public Trust in Government Agencies and their Employees. *Administration and Society* 30 (2): 166-93.
- Thomas, John Clayton and Gregory Streib. 2003. The New Face of Government: Citizen-initiated Contacts in the Era of E-government. *Journal of Public Administration Research and Theory*. 13 (1): 83-102.

- Toffler, Alvin. 1995. *Creating a New Civilization: The Politics of the Third Wave*. Kansas City, MO: Turner.
- Tolbert, Caroline. 2003. Direct Democracy and Institutional Realignment in the American States. *Political Science Quarterly* 118 (3): 467-489.
- Tyler, Tom R. 1990. *Why People Obey the Law*. New Haven: Yale University Press.
- Tyler, Tom R. 1998. Trust and Democratic Government. In *Trust and Governance*, Valerie Braithwaite and Margaret Levi, eds., 269-94. New York: Russell Sage Foundation.
- United Nations, Division for Public Economics and Public Administration and American Society for Public Administration. 2001. Benchmarking E-government: A Global Perspective. Available [online]: <http://www.unpan.org/e-government/Benchmarking%20E-gov%202001.pdf>. [4 January 2004].
- Welch, Eric W., Charles Hinnant and M.Jae Moon. Forthcoming. Linking Citizen Satisfaction with E-Government with Trust in Government. *Journal of Public Administration Research and Theory* 15(1): In press.
- West, Darrell M. 2000. Assessing E-government: The Internet, Democracy, and Service Delivery by State and Federal Governments. Washington, D.C.: World Bank. Available [online]: www.Worldbank.org/publicsector/egov/EgovReportUS00.htm [21 June 2002].
- West, Darrell M. 2003a. State and Federal E-government in the United States, 2003. Center for Public Policy, Brown University, September 2003. Available [online]: www.insidepolitics.org/egovt03us.pdf [4 January 2004].
- West, Darrell M. 2003b. Urban E-government, 2003. Center for Public Policy, Brown University, September 2003. Available [online]: www.insidepolitics.org/egovt03city.pdf [4 January 2004].
- West, Darrell M. 2004. E-government and the Transformation of Service Delivery and Citizen Attitudes. *Public Administration Review* 64(1): 15-27.

