

Trustworthiness, Leadership, and Organizational Performance: A Longitudinal Analysis

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Prepared for the 9th National Public Management Research Conference of Public Management Research Association, Tucson, AZ, October 25-27, 2007.

Abstract

This paper distinguishes between trust in administrative leadership and its precursors, elements of trustworthiness, which we call the trustworthiness of managerial leadership (TWML). After developing an index of TWML for individual federal employees, we demonstrate that this index varies significantly across federal agencies and over time. We then use this index to investigate the relationship between TWML and organizational performance. Key data on the trustworthiness of managerial leadership and perceptions of organizational performance are obtained from the Federal Human Capital Surveys of 2002, 2004, and 2006. By using longitudinal analysis, this paper extends previous studies on this topic which are largely confined to cross-sectional analysis. Using recursive hierarchical linear models and seemingly unrelated differences-in-differences models, we confirm that (1) TWML is strongly and positively associated with several measures of performance within federal agencies, (2) organizational characteristics condition this relationship between TWML and performance, and (3) changes in average levels of TWML within federal agencies over time are associated with changes in the perceived performance of these agencies, indicating that trustworthiness has a causal effect on performance. These results indicate that trustworthiness has significant potential as a management tool within organizations. Consequently, public management scholars and practitioners might be well served by encouraging managers to foster a greater belief in their trustworthiness among federal line employees.

I. Introduction

The role of trust in fostering effective democratic governance is an infrequent but recurring theme in governance studies. At the macro level, for more than a generation scholars have generally decried significant declines among the American public in the trust they place in governing institutions, though they have sometimes disagreed on the sources of this distrust and the resulting implications (Miller 1974; Citrin 1974; Nye, Zelikow, and King, 1997). More recently, scholars of American politics have identified several important consequences of reduced trust in government, including lower performance ratings of governing institutions, lower voter turnout in federal elections, greater support for term limit proposals and third party candidates, and substantially different policy preferences among less trusting citizens (Hetherington 1998; Hetherington and Nugent 2001; Hetherington and Globetti 2002; Rudolph and Evans 2005). Similar conclusions have been reached in comparative perspective, where greater levels of interpersonal trust have been associated with more productive civic institutions and reductions in the transaction costs associated with these institutions (Putnam 1993, 2002).

Trust has also come to play an important role in implementation studies. In particular, higher levels of trust in those responsible for policy implementation are associated with greater compliance with governmental regulations (La Porte and Metlay, 1996; Scholtz and Lubell 1998) and more public-minded behavior by industries not yet subject to these regulations (Potoski and Prakash 2006). Trust between government agencies, nonprofit organizations, and the governed is even more important in the modern era of collaborative, networked governance (Agranoff and McGuire 2003). Consequently, scholars have turned their attention to how governing procedures and practices might be changed to generate greater levels of interpersonal and interorganizational trust among stakeholders in the implementation process (Tyler 1994; Sabatier et al. 2005; Yang 2005).

In this paper we also investigate the role that trust plays in effective governance, though our focus differs from those studies summarized above in three important ways. First, rather than examining the effect of trust per se, we study the *precursors* of trust, or what is often called *trustworthiness*. Second, we confine our attention to the trustworthiness attributed to supervisors within federal agencies, which we term the *trustworthiness of managerial leadership* (hereafter TWML). Third, we assess the consequences of trust in an intra-organizational administrative context. That is, rather than investigating the consequences of trustworthiness for citizens attitudes or the behavior of regulated entities, we examine the effect that TWML has on the perceptions of agency performance for workers within these federal agencies. Specifically, we seek to answer two questions. First, is TWML associated with increased organizational performance? And second, can we infer a causal relationship between TWML and organizational performance by studying this relationship over time?

We obtain our measures of TWML and organizational performance from the Federal Human Capital Surveys (FHCS) of 2002, 2004, and 2006. Using a series of recursive hierarchical linear models, we find that higher levels of the trustworthiness of managerial

leadership are strongly and positively associated with several indicators of organizational performance. In addition, by employing seemingly unrelated differences-in-differences models, we demonstrate a likely causal relationship between changes in TWML and changes in organizational performance over time. These results indicate that trustworthiness has significant potential as a management tool within organizations. Consequently, public management scholars and practitioners might be well served by encouraging managers to foster a greater belief in their trustworthiness among federal line employees.

II. Trust, Trustworthiness, and Governance

Trust and Trustworthiness

As discussed, we focus on trustworthiness of managerial leadership rather than trust itself. Although trust has been the object of research more often than trustworthiness, trust does not change in itself. Thus, from management perspective, one might want a tool to leverage trust if trust really matters. Trustworthiness has been noted among scholars as such a tool. Regarding the difference, first, one needs to make a conceptual difference between trustworthiness and trust. After decades of trust research, Rousseau, Sitkin, Burt, and Camerer (1998) found that most scholars investigating interpersonal trust share a similar definition of trust, which emphasizes a psychological aspect of it. Representatively, Mayer et al. (1995, p.712) define trust 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 important to the trustor, irrespective of the ability to monitor or control that other party.” According to the definition, trust is neither a behavior nor a choice; it is an underlying psychological condition that can cause or result from such actions (Rousseau et al., 1998). On the other hand, trustworthiness has been frequently mentioned as antecedents of trust. One can rarely find research defining this concept clearly. According to Oxford English Dictionary (2007), trustworthy means “worthy of trust or confidence; reliable.” Thus, at least conceptually, trustworthiness works as a necessary condition for trusting someone. One can also find empirical support that trustworthiness leads to trust (e.g. Davis, Schoorman, Mayer, and Tan, 2000).

Sometimes, differentiating trust from trustworthiness is not easy. Under some contexts, evaluation of trustworthiness of someone becomes trust in him or her (Hardin, 2002). However, one cannot ignore the distinction; while trust focuses on a trustor’s psychological state that he or she is willing to take risks in spite of lack of monitoring or control, trustworthiness focuses on characteristics of a trustee. That is, evaluating that a supervisor is trustworthy and willingly taking some risks for the supervisor are different. From social exchange theory perspective (Blau, 1964), an employee will trust his or her supervisor by reciprocating to the trustworthiness of the supervisor.

Elements of Trustworthiness

As scholars perceive the value of trust as managerial resource, there has been effort to find the elements of trustworthiness as antecedents of trust. Interviewing 84 managers, Butler (1991) suggested ten conditions of trust: availability, competence, consistency, discreetness, fairness, integrity, loyalty, openness, promise fulfillment, and receptivity. Other scholars indicated benevolence (Larzelere and Huston, 1980), trustworthy intentions (Cook and Wall, 1980), value

congruence (Sitkin and Roth, 1993) and personal attraction (Giffin, 1967) as elements of trustworthiness.

Mayer et al. (1995) synthesized these elements into three core antecedents of trust under the title of “factors of perceived trustworthiness”: ability, benevolence, and integrity. Ability is understood as trustee’s competence on his role in the organization. The factor is critical in that it serves as a fundamental basis of trust building. The phrase “A trusts B” implies that “A trusts B to do C” where “C” will be different across different objects and contexts (Hardin, 2006). Thus, if a trustee does not have ability to do something that a trustor expects, trust might not emerge at all. Likewise, in federal workplace, employees will trust their managers for their various roles when they are confident on the managers’ basic competence in their role. Benevolence is “the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive,” which means that the trustee has positive attachment to the trustor (Mayer et al., 1995, p.718). Integrity is somewhat a broad concept involving issues such as “the consistency of the trustee’s past actions, credible communications about the trustee from other parties, belief that the trustee has a strong sense of justice, and the extent to which the trustee’s actions are congruent with his or her words” (Mayer et al., 1995, p.719). Following Mayer et al. (1995), this study considers these three as the main factors of trustworthiness and tests whether they are still applicable to public organizations.

Consequences of Trust and Trustworthiness

Most existing research on trust and trustworthiness is done in the business management field. Main outcomes of trust include information sharing, well-managed negotiation process, individual and unit performance, job satisfaction, acceptance of goal, etc. (Dirks and Ferrin, 2001). When considering trustworthiness works as a critical antecedent of trust (Davis et al., 2000), one can expect that trustworthiness can also affect those outcomes. Besides, leadership literatures support the direct positive effect of each factor of trustworthiness. Among the factors, ability and benevolence have been extensively explored and discussed in leadership studies. One can find empirical support on their positive effects on various performance measures in research from trait theories of leadership as well as one from behavioral approach of leadership (Robbins and Judge, 2008; Bass, 1990; Northouse, 2004; Fiedler, 1986; Fiedler, O’Brien, and Ilgen, 1969; Levinson, 1980; Downton, 1973; Katz, 1955). Integrity, although it is relatively less researched, has been discussed under the theme of consistency of leadership with the consideration of honesty as a personal trait of leaders. Although the evidence is mixed, several studies support that consistent leadership is more favored than variable application of it (Block and Kennedy, 1986; Aldag and Brief, 1977). Especially, when an evaluator is the subordinate of the leader, consistency is more preferred (Heilman, Hornstein, Cage, and Herschlag, 1984). Under modern approach of leadership including transformational leadership, the three factors of trustworthiness are implicitly or explicitly assumed as conditions for effective leadership (Podsakoff et al., 1990; Mumford, Zaccaro, Connelly, and Marks, 2000; Robbins and Judge, 2008).

Although the above research may provide enough evidence for value of trust and trustworthiness, one can still find some gaps to be filled. First, as discussed, they largely come from private sector. One can find good discussion on the importance of trust and the necessity of good leaderships in public administration field (Fairholm, 2004; Riccucci, 1995; Ruscio, 1996; Carnevale, 1995), but few researches directly deals with trustworthiness as a leadership trait. And most studies on the issue of trust and trustworthiness are confined to case studies or normative discussion. Thus, providing a generalized result regarding the effect of

trustworthiness of managerial leadership within federal agencies is one of the contributions of this study. Second, many of the existing research on trust and trustworthiness are cross-sectional study, which cannot exclude the possibility of reverse causation. By implementing the longitudinal analysis, this study produce more robust results on causal effect of trustworthiness and reveals how the effect changes within the same organization. Third, a necessity of exploring such contextual factors has been noted among scholars, but not much research is done yet (Dirks and Ferrin, 2001; Schoorman, Mayer, and Davis, 2007). This study begins to fill this huge gap by considering organizational characteristics including leadership change and structural change. Not only their effect on perception of TWML, but also cross-level effect between them and the effect of TWML are tested. Finally, while many studies focus on a specific narrow outcome, this study considers multiple outcomes and explores the relationship among them. Using a recursive causal model, it provides a more comprehensive picture of how TWML works and how its outcomes are related one another.

III. Measuring Trustworthiness and Organizational Performance

If we are to estimate the effect of the trustworthiness of managerial leadership on perceptions of organizational performance, we need robust measures of each concept. Ideally, these measures would come from large, systematic samples of public servants. Fortunately, the Federal Human Capital Surveys (FHCS) of 2002, 2004, and 2006 provide just this type of sample. The purpose of the FHCS is to measure the perception of Federal Employees about “how effectively agencies are managing their workforces” (Office of Personnel Management, 2007, p.34). Since 2002, the Office of Personnel Management (OPM) has conducted the survey every two years. The 2006 FHCS includes 84 questions in eight topic areas: Personal Work Experiences; Recruitment, Development, and Retention; Performance Culture; Leadership; Learning (Knowledge Management); Job Satisfaction; Satisfaction with Benefits; and Demographics (Office of Personnel Management, 2007). The survey sample was randomly selected among full-time, permanent employees from 29 major agencies on the President’s Management Council and 59 small / independent agencies. Between the end of May and August 2006, a total of 221, 479 completed the survey mainly through using self-administered online survey, the response rate of which is 57 percent (Office of Personnel Management, 2007). Likewise, the 2002 and 2004 FHCS were implemented during summer 2002 and 2004, and they share many questions with the FHCS 2006. 71 questions are commonly used between the 2004 and 2006 FHCS, while 59 questions are shared between the 2002 and 2006 FHCS. For the FHCS 2004, nearly 150,000 Federal employees responded with 54 % response rate, while 2002 survey has nearly 100,000 respondents.

Measuring the Trustworthiness of Managerial Leadership

The research summarized in the previous section indicates that employee perceptions of the trustworthiness of leaders are a function of the ability, integrity, and benevolence of those leaders. The FCHS contains questions that directly tap each of these three concepts.

Respondents answer these questions using a Likert scale ranging from 1 (lowest rating) to 5 (highest rating). Specifically, employee assessments of the ability, integrity, and benevolence of their immediate supervisors is captured by the following questions (each of these questions is asked each year):

Ability: *Overall, how good a job do you feel is being done by your immediate supervisor / team leader?*

Integrity: *My organization's leaders maintain high standards of honesty and integrity.*

Benevolence: *My supervisor supports my need to balance work and family issues*

Discussions with my supervisor / team leader about my performance are worthwhile.

Supervisors / team leaders in my work unit support my / employee development at work

In order to represent the trustworthiness of managerial leadership using a single indicator, we first included the three indicators of Benevolence in a preliminary factor analysis. This analysis produced a single common factor with an Eigenvalue of x.xx that accounted for xx percent of the combined variance. We then entered this benevolence factor, along with responses to the Ability and Integrity questions, into a second factor analysis. This analysis also produced a single common factor with an Eigenvalue of 2.22 that accounted for 74 percent of the combined variance of the constituent indicators. Moreover, the respective factor loadings demonstrate that the indicators of Ability, Integrity, and Benevolence are strongly correlated with the resulting TWML factor score. We use this common factor score as our key measure of the trustworthiness of managerial leadership.

Measuring Perceptions of Organizational Performance

Public management research has coalesced around the notion that organizational performance is a multi-dimensional concept. At a minimum, organizational performance can be judged using external criteria (e.g., progress made toward policy goals or success at managing important stakeholder groups) or internal criteria (e.g., strong communication systems, stable and predictable organizational control, and high levels of workforce cohesion and morale) (for good reviews of the organizational performance literature, see Cameron and Whetton 1983; Quinn and Rohrbaugh 1983; Rainey and Steinbauer 1999; Rojas 2000). While the effect of leadership trustworthiness on organizational performance is important, our primary research question investigates the effect that the TWML has on *employee perceptions of organizational performance*. Our measures of organizational performance, then, come from the FHCS rather than from objective indicators of goal attainment or employee turnover.

Relying upon perceptions of organizational performance, however, does not excuse us from employing multiple measures that are consistent with the multidimensional nature of this concept. When investigating the effects of trust, Dirks and Ferrin (2001) divide organizational performance into two categories: 1) workplace behaviors and performance outcomes and 2) workplace attitudes and cognitive constructs. The former includes communication and information sharing, organizational citizenship behavior, negotiation behaviors, individual performance, and unit performance (Davis, Schoorman, Mayer, and Tan, 2000; Dirks and Ferrin, 2002; Culbert and McDonough, 1986; Bennis and Nanus, 1985; Zand, 1972). On the other hand, job satisfaction and low turnover intention are examples of the latter (Mayer et al., 1995; Brockner, Siegel, Daly, Tyler, and Martin, 1997; McAllister, 1995; Dirks and Ferrin, 2001; Davis et al., 2000).

We employ three indicators of organizational performance that are consistent with the schema of Dirks and Ferrin: job attitudes, and cooperative behaviors, and the overall performance of work-unit. The FCHS contains questions that directly tap each of these three elements of organizational performance. Respondents answer these questions using a Likert scale ranging from 1 (lowest rating) to 5 (highest rating). Specifically, employee perceptions of job attitudes, cooperative behaviors, and work quality are captured by the following questions (each of these questions is asked each year)¹:

Job Attitudes: *Considering everything, how satisfied are you with your job?*

The work I do is important.

My work gives me a feeling of personal accomplishment.

Cooperative Behaviors: *The people I work with cooperate to get the job done*

Employees in my work unit share job knowledge with each other

Performance: *How would you rate the overall quality of work done by your work group?*

In order to get a single indicator of Job Attitudes and Cooperative Behaviors, we included the questions tapping these concepts into a factor analysis. The analysis of Job Attitudes

¹ Traditionally, job attitudes are comprised of job satisfaction, job involvement, and organizational commitment. Although the given measures cannot include all ranges of the concept, they are expected to represent substantial portion of the concept. Job satisfaction is the most frequently investigated measure of job attitude. Job meaningfulness and organizational mission attachment also reflect job attitudes because they present the level of congruence between individual and their job / organization.

produced a single meaningful common factor with an Eigenvalue of 2.10 that accounted for 70 percent of the shared variation among these responses. We use this factor score as our measure of Job Attitudes. The analysis of Cooperative Behaviors produced a single meaningful common factor with an Eigenvalue of 1.49 that accounted for 75 percent of the shared variation among these responses. We use this factor score as our measure of Cooperative Behavior. We use the single questions assessing perceptions of work unit performance as our indicator of work quality.

IV. Modeling Organizational Performance

The trustworthiness of managerial leadership is not the only factor affecting perceptions of organizational performance. In order to estimate the independent effect of TWML, then, we need to place this measure within a fully specified model of organizational performance. Models of this type are complicated because perceptions of organizational performance are affected both by the characteristics of the organizations and by the characteristics of the individuals within these organizations. Moreover, these perceptions can also change over time. Models of perceived organizational performance, then, must include individual factors, organizational characteristics, and temporal elements.

Individual Characteristics Affecting Perceptions of Performance

Our measures of the perception of organizational performance come from the survey responses of individual federal employees, and numerous individual characteristics might affect these perceptions. In order to keep our model parsimonious, however, the model emphasizes individual characteristics that are likely correlated with both perceptions of organizational performance and the trustworthiness of managerial leadership, for it is the exclusion of these factors that pose the greatest threat to the consistency of our parameter estimates for TWML. Accordingly, our model includes variables representing perceptions of the adequacy of individual and organizational resources, the supervisory status of survey respondents, and their gender and ethnicity.

Individual resources. Resources are important to individual workers as well as to organizations. Individuals with sufficient resources will be more productive, more available to others, and have a more optimistic attitude (Giddens, 1991). Therefore, we hypothesize that individual resources are positively associated with perceptions of organizational performance. Individual resources are measured using responses to the following question from the FHCS. Respondents answer this question using a Likert scale ranging from 1 (lowest rating) to 5 (highest rating).

I have sufficient resources (for example, people, materials, budget) to get my job done

Organizational resources. The importance of acquiring sufficient resources for organizational effectiveness has been widely acknowledged in both external environment and

internal management (e.g., Casciaro and Piskorski, 2005; Pfeffer and Salancik, 1978). The importance of this variable is also well recognized in the literature on public bureaucracy. Mazmanian and Sabatier (1989) consider it as one of the most important factors that can affect successful implementation of publicly funded programs. Boyne (2003) also considers resources as one of the five determinants of public service performance, and some empirical findings support this assertion (Meier and O'Toole, 2002; Bohte, 2001). Therefore, we hypothesize that organizational resources are positively associated with perceptions of organizational performance. In their framework of effective government agencies, Rainey and Steinbauer (1999) provide three kinds of resources as a factor for organizational effectiveness: financial resources, human resources, and technological resources. Our measure, which utilizes responses to the following FHCS question, captures the human and technological facets of organizational resources. Respondents answer this question using a Likert scale ranging from 1 (lowest rating) to 5 (highest rating).

The workforce has the job-relevant knowledge and skills necessary to accomplish organizational goals

Supervisory Status. Employees with supervisory status usually have more responsibility and greater discretion in doing their work. They also often find themselves in the position of a representative of their organization (Gould-Williams and Davies, 2005; Eisenberger et al., 1990). A well known result from previous research across multiple disciplines is that the more responsibility an individual has for a particular decision, the more satisfied they will be with this decision. Extending this result to organizational performance, we hypothesize that employees with supervisory status will have more positive perceptions of organizational performance. We measure this concept using a dichotomous variable coded 1 for employees with supervisory responsibilities and 0 otherwise. This variable is coded from responses to a supervisory status question on the FHCS.

Gender and Ethnicity. Because our performance variables are measured using individual perception, the value of responses to the relevant survey questions may be conditional upon individual demographic characteristics. For example, the attitudes, values, methods of interpersonal interaction, and workplace perceptions often vary significantly according to the gender and ethnicity of public employees (Wang and Yamagishi, 2005; Lin, 2001; Campbell and Rosenfeld, 1985; Browne, 2000; Jackson and Alvarez, 1992; Loden and Rosener, 1991). In general, however, we know very little about the effect of workplace diversity on organizational performance (Wise and Tschirhart 2000; Pitts 2005). With respect to gender, some empirical studies report that females have more negative perceptions of their organizational performance (Kim, 2004). The results with respect to race and ethnicity are more mixed. While some scholars insist that racially heterogeneous workplaces show high performance (McLeod and Lobel, 1992; O'Reilly, Williams, and Barsade, 1997), other scholars report negative effects of high proportion of racial diversity (Pelled, 1997; Thomas, 1999; Timmerman, 2000). The results from this research, coupled with the fact that women and ethnic minorities have a higher probability of experiencing difficulties including discrimination (Spector and Jones, 2004; Timms, Graham, and Caltabiano, 2006; Jackson and Alvarez, 1992; Loden and Rosener, 1991), lead us to expect that they will have more negative views on organizations and their perception of performance will be lower than others. Gender is measured using a dichotomous variable coded 1 for women

and 0 for men, and ethnicity is measured using a dichotomous variable coded 0 for whites and 1 for all others. These variables are coded from responses to gender and ethnicity questions on the FHCS.

Organizational Characteristics Affecting Perceptions of Performance

We consider the effect of two organizational characteristics on perceptions of organizational performance: leadership change within the organization, and structural change within the organization. At least since the beginning of the “reinventing government” movement, pursuing efficiency through business-like operations has been emphasized in the public sector. Frequently, leadership change and reorganization have used as visible signs that the public sector is renovating itself (Johnston, 1999). With respect to leadership change in particular, Wood and Waterman (1991) show that political appointments are very powerful tools for changing policy actions within administrative agencies. Indeed, these authors go so far as to state that “the leadership of an agency is the most frequent mechanism for changing agency behavior (p. 822).” If leadership change has such a meaningful effect on agency performance, it is not a stretch to believe that such changes will also affect perceptions of performance. With respect to structural change, this often comes with government reform, and the pace of such reforms has been accelerating (Light, 2006). Especially, recent reforms focused on efficiency under the “New Public Management” have resulted in the dramatic downsizing of the Federal government. Additional structural reforms are constantly progressing. These changes have a critical impact on federal employees because they affect employees’ work roles, the way they work, and the way a work unit or an organization is managed (Ingraham and Jones, 1999; Morgan and Zeffane, 2003).

What effects can we expect from leadership and structural change? We expect that the effects of leadership change and structural change on perceptions of organizational performance will take two forms: (1) direct effects on the expected value of performance indicators, and (2) indirect effects through enhancing or reducing the effect of the trustworthiness of managerial leadership on organizational performance. In addition, we expect that the effects of leadership change will differ depending upon whether this change takes place at the immediate organizational level or at the highest levels of the organization. For example, for an employee of the Bureau of Reclamation, we expect that changing the head of the Bureau will have a different effect than changing the Secretary of the Interior.

Direct Effects of Leadership and Structural Change. Depending upon employees’ satisfaction with the status quo, leadership changes and structural changes might increase or decrease perceptions of organizational performance. Countering this potential indeterminacy, one of the best supported conclusions in the field of organizational behavior is that organizations and individuals resist change (Robbins and Judge, 2008). Both leadership change and structural change introduce uncertainty into organizations, and it takes some time to understand and adjust to this uncertainty. For this reason, we expect that any direct effects of leadership changes and structural changes will be to reduce perceptions of organizational effectiveness.

Indirect Effects of Leadership and Structural Change. We expect that leadership and structural changes will also have indirect effects on organizational performance by enhancing or reducing the effect of trustworthiness within organizations. Specifically, we expect that remote leadership changes – i.e., changes in the leadership at the top of the agency -- will increase the effect of TWML on perceived organizational performance. With uncertainty at top levels of agency leadership, employees will rely more on the supervisors within their work unit than they

already know and trust. This expectation is reflects the work of several scholars who indicate the importance of middle managers, especially under reinvention process, in that they shape the behaviors of subordinates and work as linkages between top management and front-line workers (Kettl, 1995; Ingraham and Jones, 1999; Colvard, 1994). Similar uncertainty surrounds structural changes within organizations. On the other hand, the uncertainty produced by immediate or proximate changes in agency leadership – i.e., changing those managers at the subagency level noted previously – ought to reduce the effect of TWML on perceived agency performance. Even if initial impressions indicate that the new leader is trustworthy, we expect that employees will reserve judgment on the resulting changes in organizational performance.

We expect that the indirect effect of structural change will be similar to the effect of remote leadership change. Like remote leadership change, structural change generates a great deal of general uncertainty within organizational subunits. We expect that employees will react to this uncertainty in much the same way as they react to remote leadership change; i.e., by relying more upon the familiar relationships forged with immediate leaders. Thus, we expect that the effect of TWML on perceived organizational performance will increase immediately following structural changes in governing agencies. The *total* effect of structural change on organizational performance, however, is complicated by the fact that while such changes might strengthen the relationship between TWML and performance, *these same changes are expected to reduce overall levels of TWML*. Reorganization brings dramatic alterations to employees work environments. Morgan and Zeffane (2003) show that any kind of organizational change negatively affects trust in management, with structural change having the largest negative effect. The problem becomes worse when considering that reorganization often accompanies downsizing. The negative effect of downsizing is not confined to victims. Survivors suffer not only physically with increased workload and unclear work roles, but also psychologically with anxiety, distrust, fear, and insecurity in organization (Ingraham and Jones, 1999; Hughes, 2000). As time is required to recover from these feelings of anxiety and loss (Hughes, 2000), the level of TWML should decrease for a while after the reorganization.²

Leadership change and structural change are measured by using the U.S. Government Manual. Revised every June, the Manual includes specified information for virtually all government agencies including Cabinet Departments, Independent Agencies such as Boards and Commissions, and some Government Corporations. Leadership change is investigated by comparing whether a leadership position is held by the same person across years. Two variables are created: leadership change at Department / Agency level (i.e., remote leadership change) and leadership change at sub-unit level (i.e., immediate leadership change). Structural change is investigated using two steps. First, we compare organizational charts provided by the U.S. Government Manual. If there is any change, we confirm the change by checking if the relevant leadership position is created or terminated. Some organizations, especially independent agencies, do not provide any organizational chart, or they do not appear in the U.S. Government Manual. For those cases, we acquired the relevant information by referring to their website or

² This expectation would be incorrect if the reorganization was employee driven or if line workers were consulted extensively. Most government reorganizations are top-down affairs, however, made for political reasons (Johnston, 1999; Radin and Hawley, 1988; March and Olson, 1983). Accordingly, this study assumes that structural change will reduce TWML.

annual reports. When we could not obtain information on structural change using these methods, the data were treated as missing.³

The leadership change and structural change variables are trichotomous. If no change takes place during a given period, a zero is assigned to that case. When there is change in leadership or structure, time is considered. Because FHCS is implemented in 2002, 2004, and 2006, there is a two-year interval between each survey. Thus, one can find that there is a leadership change in agency A between June 2002 and June 2003, while a similar change takes place in agency B between June 2003 and June 2004. When considering the role of time in adapting to a new environment, one can expect that the longer the time elapsed after the change, the smaller the effect of the change. Thus, a value of one is given for changes occurring between one and two years before the survey, and a value of two is given for changes within one year before the survey.

Temporal Changes in Perceived Performance

We expect that levels of perceived organizational performance will change over time. While this expectation should hold during nearly all historical periods, it is likely to be especially true during the five years surrounding the FHCS used in this analysis. In the period immediately prior to the 2002 FHCS, President Bush was barely one year into his first term and was promoting his administration as one seeking to unite citizens and public servants alike behind a common goal of improving prosperity and national security. Bush's post-9/11 approval rating was well above 70 percent, and public confidence in government was higher than at any time in the past 20 years. At the time of the 2004 FHCS, federal employees had experienced nearly three years of President Bush's personnel strategy of appointing leaders on the basis of loyalty over most other competing criteria. Bush's approval ratings were hovering near 50 percent, and public confidence in government had fallen as well. By the time of the 2006 FHCS, the President's administrative priorities were embattled on all fronts, his popularity had fallen to near-historic lows for the modern era (35 percent), and public confidence in government had eroded further. In short, the era of the FHCS has been marked by extraordinary volatility in Presidential approval, public confidence in government, and the exercise of Presidential power within the executive branch. It would be unusual, then, if federal employees' perceptions of organizational performance remained immune to these changes in the broader political environment.

Relationships Among Performance Indicators

Finally, we expect our three indicators of perceived organizational performance will themselves be related. That is, perceptions of organizational performance will be affected by other, causally prior perceptions of organizational performance. While attitudinal and behavioral indicators of performance in the workplace are two of the most studied issues in individual-level organization research, their relationship is still a topic of debate (Harrison, Newman, and Roth, 2006). One representative example is whether job satisfaction leads to high performance. Some scholars provide evidence that job satisfaction has weak relationship with performance while it has much stronger relationships with employee retention, absence, and turnover (Iaffaldano and Muchinsky, 1985; Katz and Kahn, 1978; Heneman, Schwab, Fossum, and Dyer, 1983; Herzberg,

³ Ten out of one hundred forty seven organizations have missing value for their structural change. The total number is the sum of organizational entities used from 2002, 2004, and 2006 surveys. Among these, twenty seven organizations are overlapped across three surveys.

Mausner, Peterson, and Capwell, 1957; Vroom, 1964). From one aspect, it makes sense in that job satisfaction might be largely determined by maintaining organizational membership where working less and paid well rather than by achieving any given goals (Wright, 2001). However, recent empirical reviews suggest that there is significant relationship between job satisfaction and performance (Judge, Thoresen, Bono, and Patton, 2001; Harrison, Newman, and Roth, 2006). The findings of Judge et al. (2001) and Harrison et al. (2006) are persuasive in that they both reach at the conclusion based on meta-analysis. Relying on this current empirical support, we assume that job attitudes will lead to cooperative behaviors within federal agencies.

Furthermore, we assume that these two mid-level outcomes, job attitudes and cooperative behaviors, affect work-unit performance, which is measured by perceived work quality. Importantly, cooperation is seen as a prerequisite for successful innovation and productivity improvement both within and between organizations (Norris, 1990; Deery and Iverson, 2005; Steiner, 2003). As indicators of cooperation, the importance of teamwork and information sharing becomes more important in current work environment. Teamwork has been studied as an essential factor for high performance (Kuipers and Witte, 2005; Hoegl and Gemuenden, 2001; Morley and Heraty, 1995). Especially, Ingram and Jones (1999) indicate the characteristics of newly changing condition of federal workplace include frequent team arrangements, which makes teamwork a more valuable resource. In addition, information and knowledge sharing is critical under the current trend of collaboration and network governance (Norris, 1990; Agranoff, 2003), and this should also apply within the work units tasked with network collaboration. Job attitudes should also influence the performance of work-units independent of their effect on cooperative behavior. In summary, we expect a causal ordering of performance indicators in which job attitudes influence cooperative behaviors, and both of these in turn influence perceptions of work quality.

[Figure 1 About Here]

A Hierarchical Linear Causal Model of Perceived Organizational Effectiveness

Figure 1 presents a recursive causal model illustrating the relationships between individual characteristics, organizational factors, temporal effects, and perceptions of organizational performance discussed above. By using data from the 2002, 2004, and 2006 FHCS, we have observations on individuals nested within organizations, with both individuals and organizations nested within years. The independent effects of temporal, organizational, and individual factors on performance, coupled with the conditioning effects of organizational factors on the effect of the trustworthiness of managerial leadership, make this model especially well suited for estimation using Hierarchical Linear Modeling (HLM) (Byrk and Raudenbush 2002). Specifically, Figure 1 illustrates a three level hierarchical model with random intercepts at levels 2 and 3, random slopes for TWML at level 2, and cross level effects between level 2 organizational factors and the level 1 indicator of TWML. This model is estimated using the following equations:⁴

⁴ To save space, only the parameters with higher level variance are subscripted and receive their own equations at the higher level. That is, β_2 is actually β_{2jt} , but since the effect of individual resources on organizational performance is not expected to vary across agencies or over time, we use the simpler subscript.

Level 1:
$$Y_{ijt} = \beta_{0jt} + \beta_{1j} \text{TWML} + \beta_2 \text{ Individual Resources} + \beta_3 \text{ Organizational Resources} \\ + \beta_4 \text{ Supervisory Status} + \beta_5 \text{ Gender} + \beta_6 \text{ Ethnicity} + e_{ijt}$$

Level 2:
$$\beta_{0jt} = \gamma_{00t} + \gamma_{01} \text{ Structural Change} + \gamma_{02} \text{ Immediate Leadership Change} \\ + \gamma_{03} \text{ Remote Leadership Change} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \text{ Structural Change} + \gamma_{12} \text{ Immediate Leadership Change} \\ + \gamma_{13} \text{ Remote Leadership Change} + u_{1j}$$

Level 3:
$$\gamma_{00t} = \zeta_{000} + v_{00t}$$

Mixed Model:
$$Y_{ijt} = \zeta_{000} + \gamma_{10} \text{ TWML} + \beta_2 \text{ Individual Resources} + \beta_3 \text{ Organizational Resources} \\ + \beta_4 \text{ Supervisory Status} + \beta_5 \text{ Gender} + \beta_6 \text{ Ethnicity} \\ + \gamma_{01} \text{ Structural Change} + \gamma_{02} \text{ Immediate Leadership Change} \\ + \gamma_{03} \text{ Remote Leadership Change} + \gamma_{11} (\text{TWML} * \text{SC}) + \gamma_{12} (\text{TWML} * \text{ILC}) \\ + \gamma_{13} (\text{TWML} * \text{RLC}) + v_{00t} + u_{0j} + u_{1j} \text{ TWML} + e_{ijt}$$

In this model, γ_{10} is the fixed portion of the effect of TWML on organizational performance, γ_{11} , γ_{12} and γ_{13} are the effects of TWML on organizational performance conditioned by leadership change and structural change, and u_{1j} is the random effect of TWML on organizational performance unique to each agency represented in the sample. β_2 thru β_6 are the fixed effects of individual characteristics, and γ_{01} through γ_{03} are the fixed effects of organizational factors on perceptions of organizational performance. Finally, ζ_{000} is the unconditional mean of organizational performance across all individuals, agencies, and years, v_{00t} is the random temporal element of perceived performance, u_{0j} is the random agency element of perceived performance, and e_{ijt} is the random individual element of perceived performance.

V. Preliminary Analyses

Agency and Temporal Variation in TWML and Perceived Performance

The hierarchical linear model described above assumes that the trustworthiness of managerial leadership and perceived performance vary both across agencies and over time (i.e., in the equations above, that v_{00t} , u_{0j} , and u_{1j} TWML are not equal to zero). One simple way to test this assumption in the unconditional case is by using a two-way analysis of variance (ANOVA). Table 1 presents the results of this ANOVA analysis for the TWML variable and the three organizational performance variables. As is clear from table 1, there are significant differences in average levels of TWML and perceived performance across agencies and across years, and the variance attributable to cross-agency differences is roughly ten times the variance accounted for by yearly differences. While these variance components are statistically significant, substantively they are less than overwhelming. Taken together, agency and temporal variation accounts for less than two percent of the total variation in TWML and performance indicators at the individual level. This analysis indicates that while TWML and organizational performance

do vary across agencies and over time, most of the variation in these measures will be accounted for by the fixed effects and cross level effects in the hierarchical linear models.

[Table 1 About Here]

Systematic Variation in TWML

While the main focus of our research is the effect of TWML on organizational performance, the question of systematic variability in TWML is interesting in its own right. Scholars and practitioners might be interested in whether, for example, women exhibit significantly higher or lower levels of TWML, or if increasing organizational resources increases the perceived trustworthiness of agency leaders. Assessing systematic variation in TWML is important for a second reason as well. When creating our model of organizational performance, we included individual and organizational level characteristics based on the belief that these characteristics might affect perceptions of performance. If these characteristics are also related to TWML, however, excluding them from the performance model would produce a classic situation of “selection on the observables” and result in biased and inconsistent estimates of the causal effect of TWML on perceived performance (Heckman and Hotz 1989). Therefore, using these same characteristics to predict levels of TWML provides an illustration of the bias averted by including these factors in the performance models.

[Table 2 About Here]

Table 2 presents the results of an HLM where individual level values of the TWML factor are predicted using the individual characteristics of individual resources, organizational resources, supervisory status, gender, and ethnicity, and the organizational level characteristics of remote leadership change, immediate leadership change, and structural change. The model fits random intercepts for agencies and years.

Individual characteristics have important effects on the level of trustworthiness of managerial leadership expressed by federal government workers. To begin with, the perceived adequacy of individual and organizational resources have a positive effect on TWML, and this effect is not trivial. A one unit increase in the Likert scale for these indices is associated with a .2 and .3 standard deviation increase in the TWML. Similarly, and not surprisingly, supervisors also perceive agency leadership to be more trustworthy than do non-supervisors. Finally, on average, members of racial and ethnic minority groups perceive agency leadership to be less trustworthy than do whites. Among the organizational factors, only structural changes have a significant effect on TWML, and this effect is positive, contrary to our expectations. The trustworthiness of managerial leadership does vary significantly across agencies in ways not captured by our organizational variables, however, as evidenced by the large and significant

variance component associated with agency level random effects. Similar temporal random effects are not present.

VI. Estimating the Relationship Between TWML and Agency Performance

[Table 3 and Figure 2 About Here]

Job Attitudes

The results from our HLM model predicting Job Attitudes are presented in the first column of table 3. These results are presented in standardized form in the causal diagram in Figure 2. We can draw several conclusions about the effect of TWML from these results. First, as expected, we find a positive and statistically significant relationship between the trustworthiness of managerial leadership and perceptions of organizational performance as measured by job attitudes. Trustworthiness, then, appears to be an important managerial resource in that leaders who can cultivate a perception of trustworthiness will manage organizations in which employees experience a high level of job satisfaction. Untrustworthy leaders, on the other hand, face an uphill battle in extracting high performance out of dissatisfied employees. Moreover, the effect of TWML on organizational performance is substantially quite large. As we see in Figure 2, the beta coefficient for TWML is several times larger than any other variable in the model. Not only is TWML an important predictor of Job Attitudes, it is *the dominant* predictor of this measure of organizational performance, at least in this model specification.

The generally positive effect of TWML on Job Attitudes is conditioned, however, by organizational factors. Each of the cross level effects in table 1 and figure 3 is consistent with our expectations: to wit; leadership changes at the subagency level reduce the effectiveness of TWML, while the global uncertainty generated by remote leadership changes and structural change enhances the effect of TWML on perceived effectiveness. During periods of uncertainty stemming from high level leadership changes and reorganizations, administrative subunits led by trustworthy leaders will perform better than those led by less trustworthy leaders. Stated differently, trustworthy leaders can help organizational subunits avoid the reductions in job satisfaction normally associated with structural change and high level leadership changes (e.g., see the negative parameter estimates for these coefficients).

Finally, the effect of trustworthiness on organizational performance varies significantly across agencies even after controlling for leadership and structural changes, as evidenced by the significant random effect coefficient for this variable. While we can not specify the source of this variation in TWML effect at the agency level, the negative correlation between the random intercept and random slope coefficients gives us some context for interpreting these cross agency differences. Specifically, the large negative correlation between the random TWML intercepts and slopes means that the TWML has an especially large impact on perceived organizational performance in relatively low performing agencies. That is, trustworthy leaders have the largest positive effect on employee job satisfaction in those agencies most in need of improvement in

this area. Thus, the combined take away from the analysis in table 3 and figure 2 is that when we measure organizational performance as job attitudes, trustworthy leaders manage more successful agencies, and trustworthy leaders are especially effective during periods of low agency performance and organizational uncertainty stemming from leadership and structural changes.

Table 3 and figure 2 also show that TWML is not the only factor affecting job attitudes. At the individual level, individual resources, the adequacy of organizational performance, supervisory status, women, and racial minorities are all associated with higher levels of performance on this metric. That is, supervisors, women, minorities, and employees who perceive that they have adequate resources all report higher levels of job satisfaction. Organizational factors are not nearly as important in this model. Only the parameter for the structural change variable is statistically significant, but this effect is in the hypothesized direction. *Ceteris paribus*, structural change reduces job attitudes in the short run.

Cooperative Behavior

The results from our HLM model predicting Cooperative Behavior are presented in the second column of table 3. These results are presented in standardized form in the causal diagram in Figure 3. Again, the overall effect of TWML on organizational performance is positive and significant. Individuals in agencies with trustworthy leaders also report higher levels of information sharing and other forms of cooperative behavior associated with increased organizational performance. And, as was also true for job attitudes, the causal model in figure 3 shows that the effect of TWML on cooperative behavior is relatively large in that this variable has the largest beta coefficient. Moreover, this beta coefficient underestimates the total effect of TWML on cooperative behavior because it does not include the indirect effect TWML has through its relationship with job attitudes (this indirect effect $(.493 * .205)$ is one third the size of the direct effect $(.288)$). This average effect of TWML is less affected by organizational characteristics than was true in the job attitude model. Specifically, only one cross level effect is statistically significant: as predicted, the effect of TWML on cooperative behavior is greater in agencies recently experiencing high level leadership change.

While the effect of TWML on cooperative behaviors is largely unaffected by leadership change and structural change, this effect does vary substantially across agencies as evidenced by the random effect coefficient. Moreover, we again see a large negative correlation between the effect of TWML on organizational performance and baseline levels of performance: that is, trustworthiness is more effective at increasing cooperative behavior in agencies with relatively low levels of these behaviors. The overall picture painted for cooperative behavior then is very similar to the story we tell about job attitudes. Trustworthy leaders manage agencies in which cooperative behavior is more common, and trustworthy leaders are especially effective in low performing agencies and during periods of organizational uncertainty stemming from leadership change.

While individual factors again dominate organizational factors as predictors of perceived agency performance, the effect of these factors is slightly different in the cooperative behavior model. Supervisors and respondents who feel they have sufficient individual and organizational resources are also more likely to report greater cooperative behavior. Women and racial/ethnic minorities, however, see significantly less cooperative behavior in their agencies, all other things equal. Only one organizational variable displays a significant coefficient estimate. Consistent with our admittedly weak expectations, reported cooperative behavior is lower in agencies recently experiencing a proximate change in leadership. Finally, these results support our decision to predict levels of organizational performance within a recursive causal system. Job attitudes have a large, positive effect on reported levels of cooperative behavior within agencies. It appears that satisfied employees are cooperative employees, and this relationship magnifies the effect of trustworthiness on organizational performance (see above). Indeed, the size of the beta coefficient for job attitudes in figure 3 is second only to that for TWML.

Work Quality

Results from our final models of perceived agency performance are reported in column 3 of table 3 and in figure 4. On average, the trustworthiness of managerial leadership has a positive and significant association with perceptions of work quality within organizations. Individuals in agencies with trustworthy leaders report that these organizations produce higher quality work products. The relative magnitude of the TWML effect on work quality is smaller than was true for the job attitudes and cooperative behavior models. Recall that in these prior models, TWML was the best predictor of organizational performance. Figure 4 shows that TWML is only the second strongest predictor of work quality after cooperative behavior, and the effect of job attitudes is nearly equal to that of TWML. The total effect of TWML on work quality, however – that is, the sum of the direct and indirect effects in figure 4 – is still formidable (xxxxxxxxxxx). This average effect of TWML on work quality is largely unaffected by organizational factors. As was true in the cooperative behavior model, only one of the cross level effects is statistically significant. Consistent with our expectations, TWML has a larger effect on work quality in recently reorganized agencies.

The significant random effect coefficient in table 3 illustrates that the effect of TWML on work quality varies across agencies in ways not captured by the variables in our model. Again, however, this TWML effect is inversely related to agency-specific levels of work quality as evidenced by the large negative correlation between the random slopes and intercepts. At the risk of sounding redundant, the story of the effect of relationship between TWML and work quality is the same as it was for job attitudes and cooperative behavior. Trustworthy leaders manage agencies in which perceived work quality is higher, and trustworthy leaders are especially effective in low performing agencies and during periods of organizational uncertainty stemming from structural change.

At the individual level, supervisory status and adequate organizational resources are both positively related to the perceived work quality within organizations. Adequate individual

resources, however, are unrelated to this measure of agency performance. Moreover, while women generally perceive work quality to be higher than do men, racial minorities perceive just the opposite, all other things equal. At the organizational level, immediate leadership change is associated with reduced work quality, but unexpectedly, remote leadership change is associated with higher levels of work quality. Additional investigation will be required to identify the source of this potential anomaly. Finally, the recursive modeling strategy is again supported by the fact that job attitudes and cooperative behaviors are strong, positive predictors of work quality within organizations.

VII. Estimating the Causal Effect of TWML on Performance

The previous analysis illustrates a strong and positive relationship between TWML and several measures of organizational performance. While the data employed in these models contain a temporal element, time enters the HLM equations only as random intercepts shifting the expected value of job attitudes, cooperative behavior, and work quality. The parameters for TWML-performance relationship, then, are essentially cross sectional estimates. Because of this, we have been hesitant to attribute a causal interpretation to these estimates. Other results from the hierarchical models make us doubly cautious about inferring causation from the positive correlation between TWML and performance. Specifically, tables 2 and 3 show that TWML and all three measures of perceived performance vary across agencies in ways not captured by the structural or fixed effects portions of the models. That is, unobserved organizational level factors produce systematic variation in both trustworthiness and performance. If some of the same factors affecting perceptions of TWML also affect perceptions of performance, which seemly likely, they will generate a spurious relationship between these variables in table 3. In other words, we are concerned that the TWML parameters in table 3 are biased estimates of the causal effect of TWML on perceived organizational performance, and that this bias stems from a classic case of selection on unobservables.

Thankfully, the temporal aspect of the data from the 2002 – 2006 FHCS afford an easy solution to this problem. If we are willing to assume that the unmeasured factors affecting TWML and perceived performance are temporally invariant over the short run – a common and very reasonable assumption – then we can control for the potential bias produced when excluding these factors by taking first differences and estimating a differences-in-differences model (Wooldridge 2002). Estimating this model with data from individual survey respondents is impossible, however, because we can not identify responses from the same federal employees over time. In essence, the FHCS provide data from a series of cross sections, rather than from a true panel. In this way, data from the FHCS are more like those from the General Social Survey than from the Panel Study of Income Dynamics.

While we can not measure first differences for individual respondents, we can measure these differences at the organizational level. We do this by first eliminating all observations

from organizational units that appear in a single FHCS. Next, we calculate average values of TWML, job attitudes, cooperative behaviors, and work quality for each agency in each year. We calculate similar averages for the adequacy of individual and organizational resources, and the gender and ethnic composition of agency personnel. We then calculate first differences for each of these variables and use these new variables to estimate the differences-in-differences models at the organizational level. If personnel from an organizational unit provided responses to the FHCS in all three years, this unit will provide two observations in the first differenced data set (i.e., 2004 – 2002, and 2006 – 2004). When personnel from an organizational unit responded to the FHCS in only two years, these units provide a single observation in the first differenced data set. If the trustworthiness of managerial leadership has a causal effect on perceptions of organizational performance, this will show up as a positive and significant coefficient on the TWML variable in these models.

It is worth pointing out explicitly several differences between the differences-in-differences models used in this section and the HLM models employed above. First, by taking intra-organizational averages and first differences, we are essentially eliminating the individual and temporal variance components that justified the use of HLM. The differences-in-differences models, then, are estimated using the more traditional ordinary least squares (OLS) approach. OLS, however, assumes that all observations are independent, and violations of this assumption can seriously bias estimates of parameter standard errors. Since our data set of first differences contains repeated observations for at least some agencies (i.e., agencies in which personnel responded to the FHCS in all three years), it seems likely that this assumption is violated here. Therefore, parameter standard errors from the differences-in-differences model are adjusted to account for the fact that observations are clustered by organizational unit. Third, since the variables for job attitudes, cooperative behavior, and work quality all tap the same concept (i.e., perceived organizational performance), and since the data underlying these measures comes from the same respondents in common surveys, it is likely that the errors remaining when estimating the agency performance variables are correlated across equations. The precision of our estimates can be improved if we take this cross-equation correlation into account using a seemingly unrelated regression (SUR) framework (Zellner 1962). Given the sample sizes in our HLM models, the efficiency gains from using SUR would have been negligible. With the much smaller sample sizes in our data set of first differences, however, this improvement in precision might be meaningful. To recap, then, our differences-in-differences models estimate the causal effect of changes in TWML on changes in perceived organizational performance at the agency level, observations are allowed to be correlated at the agency level, and error terms from the three performance equations are allowed to be correlated. Because of these differences, estimates of the effect of TWML on organizational performance are not comparable between the HLM and differences-in-differences models.

We can summarize the differences-in-differences model using the following equations:

$$\begin{aligned} \Delta \text{ Job Attitudes} &= \beta_{01} + \beta_{11} \Delta \text{TWML} + \sum \beta_{k1} \Delta X_k + e_1 \\ \Delta \text{ Cooperative Behavior} &= \beta_{02} + \beta_{12} \Delta \text{TWML} + \sum \beta_{k2} \Delta X_k + e_2 \\ \Delta \text{ Work Quality} &= \beta_{03} + \beta_{13} \Delta \text{TWML} + \sum \beta_{k3} \Delta X_k + e_3 \end{aligned}$$

Where:

X_k = adequacy of individual resources, adequacy of organizational resources, gender composition of agency workforce, and ethnic composition of agency workforce

$\Delta Y = Y_t - Y_{t-1}$ (where Y represents any variable in the model)

$\text{Cov } i,t | j > 0$ (where i ranges from 1 to t for each agency j).

$\text{cov}(e_1, e_2, e_3) > 0$

[Table 4 About Here]

Table 4 illustrates that increases in the average level of TWML among agency personnel effectively increase aggregate perceptions of organizational performance, regardless of whether this performance is measured as job attitudes, cooperative behaviors, or work quality. After standardizing the parameters in table 4, we can say that a one standard deviation increase in TWML leads to a .56 standard deviation improvement in job attitudes, a .75 standard deviation increase in cooperative behavior, and a .24 standard deviations increase in work quality. The result that TWML is positively and significantly related to agency performance is consistent with the outcomes reported in table 3 and figures 2-4. Given the structure of the differences-in-differences model, however, we have greater confidence that these parameter estimates represent causal effects.

While the adjusted R^2 for the three models in table 4 are fairly high, changes in the organizational performance are not completely determined by changes in TWML. For example, increased organizational resources are associated with increased organizational performance in the job attitudes and cooperative behavior models. Somewhat surprisingly, however, increases in individual resources are associated with decreases in organizational performance in all equations, and this effect is statistically significant with respect to cooperative behaviors. The lesson seems to be that the adequacy of organizational resources has a greater effect on agency performance than does the adequacy of individual resources. Second, gender and ethnicity matter as well. Increases in the proportion of female employees are associated with reductions in aggregate job attitudes and perceptions of work quality, while increases in the proportion of minority employees are associated with increases in perceptions of work quality. Finally, consistent with expectations, increases in aggregate job attitudes appear to cause increases in cooperative behaviors, and increases in both of these characteristics appears to produce increases in perceptions of overall work quality.

VII. Conclusion

Using data from the Federal Human Capital Survey, we demonstrate that the leadership traits of ability, integrity, and benevolence share an important common dimension that we identify as the trustworthiness of managerial leadership. Using recursive hierarchical linear models, we demonstrate that levels of TWML are strongly and positively associated with several measures of perceived organizational performance. Moreover, this relationship between TWML and performance is especially strong in low performing agencies and in agencies experiencing increased uncertainty due to structural and upper level leadership changes. Seemingly unrelated differences-in-differences confirm this positive relationship between TWML and perceptions of performance, and suggest that this relationship is causal in nature.

We draw several substantive conclusions from these empirical results. First, it is clear that the characteristics of agency leaders matter for the performance of public organizations. In particular, trustworthy leaders preside over more productive organizations, and these leaders are better able to maintain and even increase organizational performance in agencies challenged by low performance and perturbations in the external environment. Second, these results suggest that public managers ought to view trustworthiness not as an exogenous variable, but rather as a managerial resource to be cultivated and/or a trait used in the recruitment of new leaders. Finally, these results demonstrate in yet another venue the important role of trust and trustworthiness in fostering effective democratic governance.

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Table 1: ANOVA of Trustworthiness of Managerial Leadership and Perceptions of Organizational Performance Across Agencies and Over Time

	Agency Sum of Squares	Year Sum of Squares	Total Sum of Squares
Trustworthiness of Managerial Leadership	5,724.71*** (1.62%)	652.85*** (0.18%)	353,090.16
Job Attitudes	5,008.78*** (1.44%)	16.01*** (0.005%)	348,079.65
Cooperative Behaviors	3,148.97*** (1.37%)	470.43*** (0.20%)	229,478.67
Work Quality	3,309.13*** (1.18%)	290.12*** (0.10%)	280,894.96

* p<.05, ** p<.01, *** p<.001

Table 2: HLM Estimates of Factors Affecting the Trustworthiness of Managerial Leadership

	Trustworthiness of Managerial Leadership
Individual Fixed Effects	
Individual Resources	0.201*** (0.001)
Organizational Resources	0.302*** (0.002)
Supervisory Status	0.234*** (0.004)
Gender	0.005 (0.004)
Race	-0.112*** (0.004)
Organizational Effects	
Immediate Leadership Change	0.001 (0.008)
Remote Leadership Change	0.011 (0.011)
Structural Change	0.015* (0.009)
Variance Decomposition	
Organizational Random Effects	0.107*** (0.006)
Yearly Random Effects	0.032 (0.020)
Error Variance	0.750*** (0.001)
Model Summary Statistics	
Constant	-1.857*** (0.025)
Model χ^2	70367.40***
Regression Comparison χ^2	2650.25***
Number of Observations	214333

* p<.05, ** p<.01, *** p<.001, regression coefficients employ one tailed tests

Note: Fixed effects are regression coefficients estimated by restricted maximum likelihood. Random effects are variance components estimated by restricted maximum likelihood. Numbers in parentheses are standard errors.

Table 3: HLM Estimates of Contemporary Relationship Between Trustworthiness of Leadership and Perceptions of Organizational Performance

	Job Attitude	Cooperative Behavior	Work Quality
Effects of Trustworthiness			
Fixed Effect	0.478*** (0.008)	0.227*** (0.007)	0.156*** (0.006)
Cross Level Effect of Immediate Leadership Change	-0.008* (0.004)	-0.002 (0.004)	0.003 (0.003)
Cross Level Effect of Remote Leadership Change	0.009* (0.005)	0.010* (0.004)	0.002 (0.004)
Cross Level Effect of Structural Change	0.014** (0.005)	-0.001 (0.004)	0.007* (0.003)
Random Effect Across Organizations	0.003*** (0.0003)	0.002*** (0.0002)	0.001*** (0.0002)
Correlation of Performance and Effect of Trustworthiness	-0.892*	-0.717*	-0.494*
Individual Fixed Effects			
Individual Resources	0.057*** (0.001)	0.014*** (0.001)	0.0001 (0.0012)
Organizational Resources	0.150*** (0.002)	0.142*** (0.001)	0.114*** (0.002)
Supervisory Status	0.160*** (0.003)	0.085*** (0.003)	0.057*** (0.003)
Gender	0.009** (0.003)	-0.044*** (0.003)	0.082*** (0.003)
Race	0.047*** (0.004)	-0.061*** (0.003)	-0.034*** (0.003)
Job Attitudes		0.167*** (0.002)	0.134*** (0.002)
Cooperative Behaviors			0.358*** (0.002)
Organizational Effects			
Immediate Leadership Change	0.006 (0.006)	-0.009* (0.005)	-0.012** (0.004)
Remote Leadership Change	-0.008 (0.008)	-0.002 (0.006)	0.016** (0.006)
Structural Change	-0.013* (0.007)	0.005 (0.005)	0.003 (0.005)
Variance Decomposition			
Organizational Random Effects	0.007*** (0.0008)	0.003*** (0.0004)	0.003*** (0.0003)
Yearly Random Effects	0.0002 (0.0002)	0.001 (0.001)	0.0001 (0.0002)
Error Variance	0.404*** (0.001)	0.288*** (0.001)	0.327*** (0.001)

Model Summary Statistics			
Constant	-0.778*** (0.016)	-0.555*** (0.022)	3.734*** (0.013)
Model χ^2	37752.08***	43105.20***	78878.46***
Regression Comparison χ^2	2872.68***	2279.20***	1264.93***
Number of Observations	213955	213460	213446

* p<.05, ** p<.01, *** p<.001, regression coefficients employ one tailed tests

Note: Fixed effects and cross level effects are regression coefficients estimated by restricted maximum likelihood. Random effects are variance components estimated by restricted maximum likelihood. Numbers in parentheses are standard errors.

Table 4: SUR Estimates of Causal Effect of Trustworthiness of Managerial Leadership on Perceptions of Organizational Performance, Differences-in-Differences Models

	Job Attitude	Cooperative Behavior	Work Quality
Changes in Trustworthiness	0.375*** (0.061)	0.561*** (0.094)	0.160* (0.087)
Changes in Individual Resources	-0.010 (0.034)	-0.096** (0.038)	-0.010 (0.021)
Changes in Organizational Resources	0.223*** (0.063)	0.331*** (0.077)	-0.020 (0.058)
Changes in Gender Composition	-0.153* (0.072)	0.047 (0.059)	-0.071* (0.041)
Changes in Racial Composition	-0.071 (0.131)	0.009 (0.103)	0.180** (0.064)
Changes in Job Attitudes		-0.040 (0.117)	0.193** (0.072)
Changes in Cooperative Behavior			0.593*** (0.077)
Constant	-0.017*** (0.005)	-0.009** (0.004)	0.006* (0.004)
Adjusted R ²	0.4876	0.6530	0.7984
Number of Observations	97	97	97

* p<.05, ** p<.01, *** p<.001, one tailed tests

Note: Estimates are seemingly unrelated regression coefficients with standard errors in parentheses. Standard errors are corrected by allowing observations to be correlated within organizational units.

Figure 1. Framework for Longitudinal Analysis of TWML

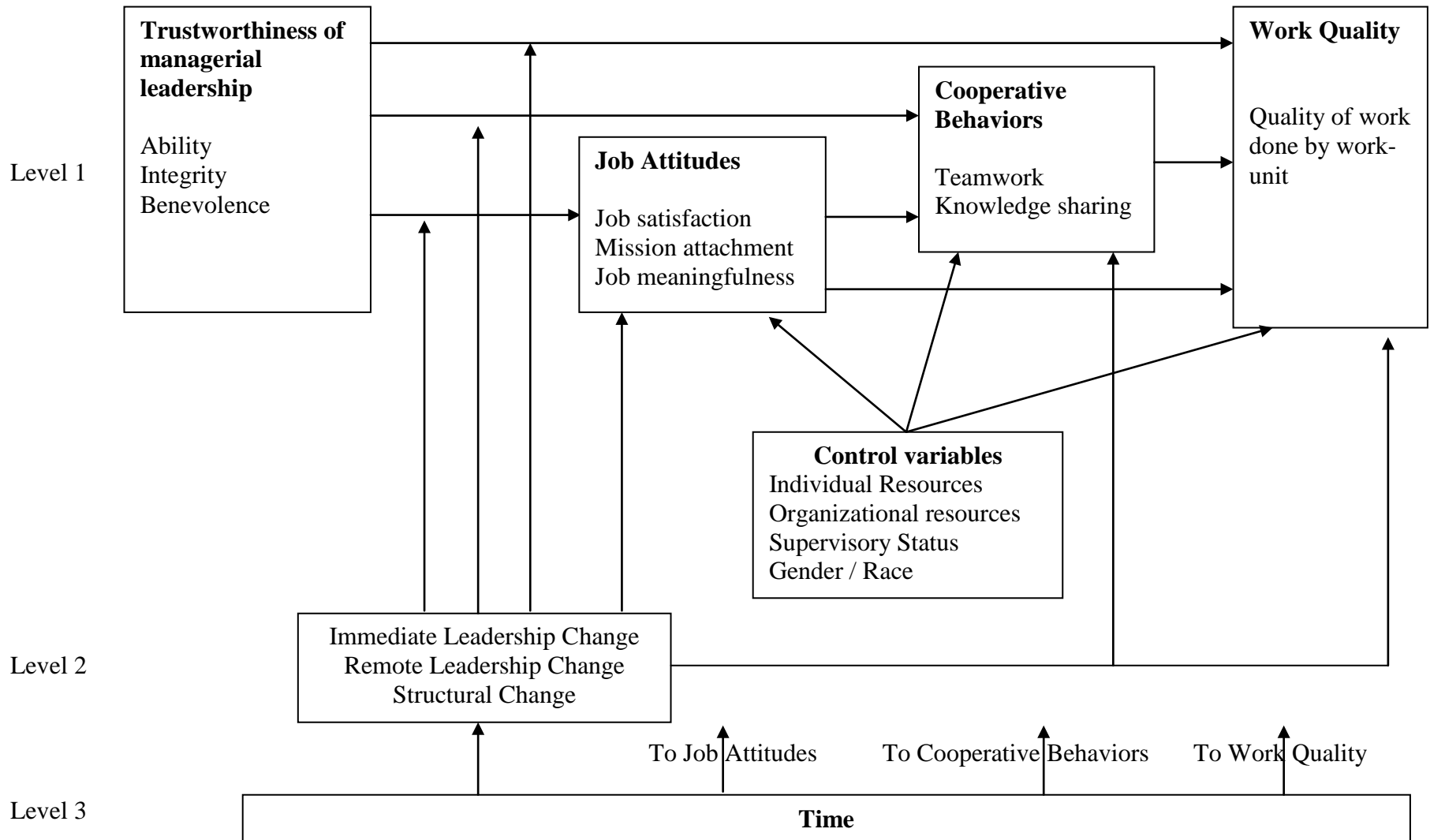
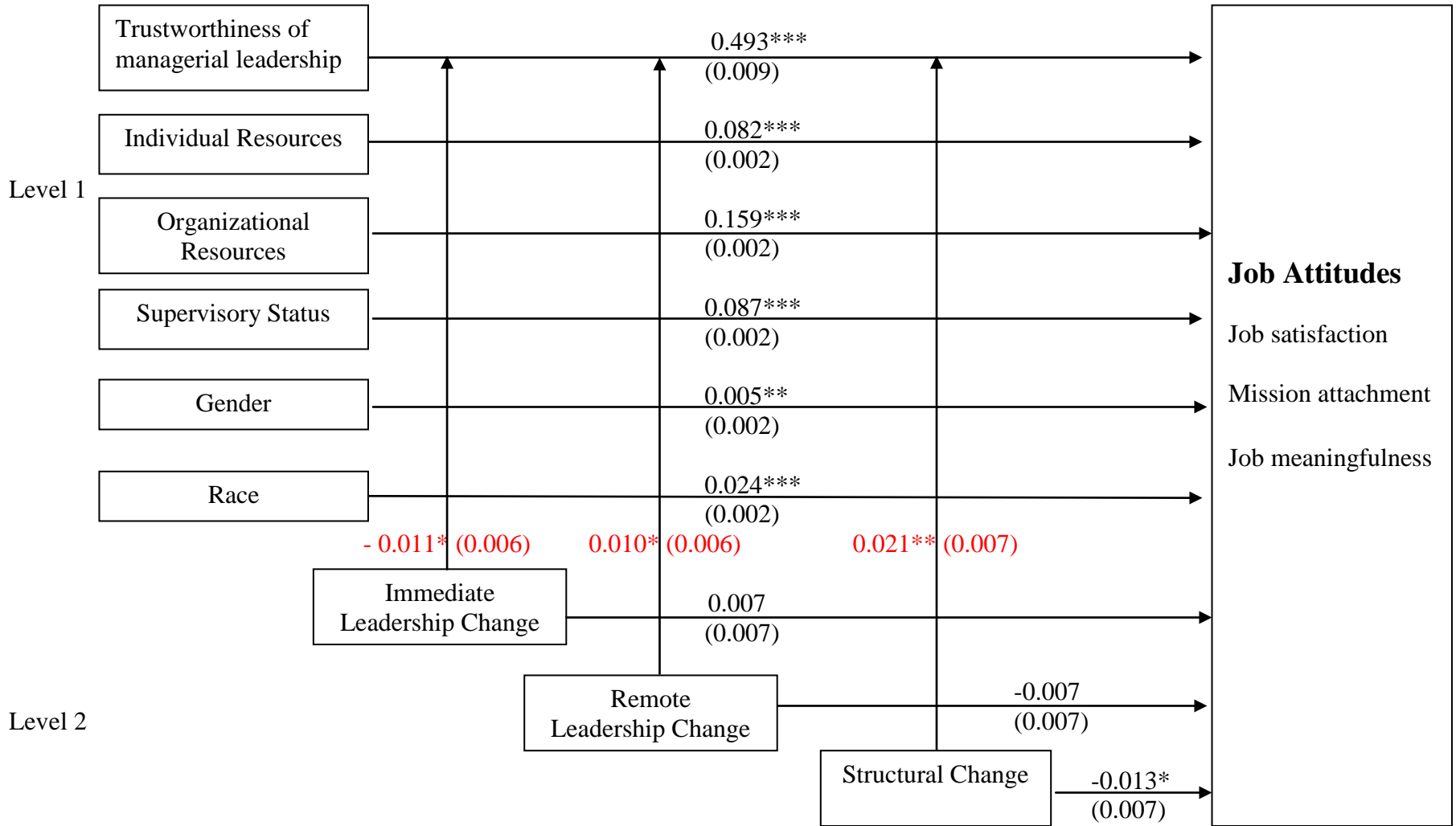
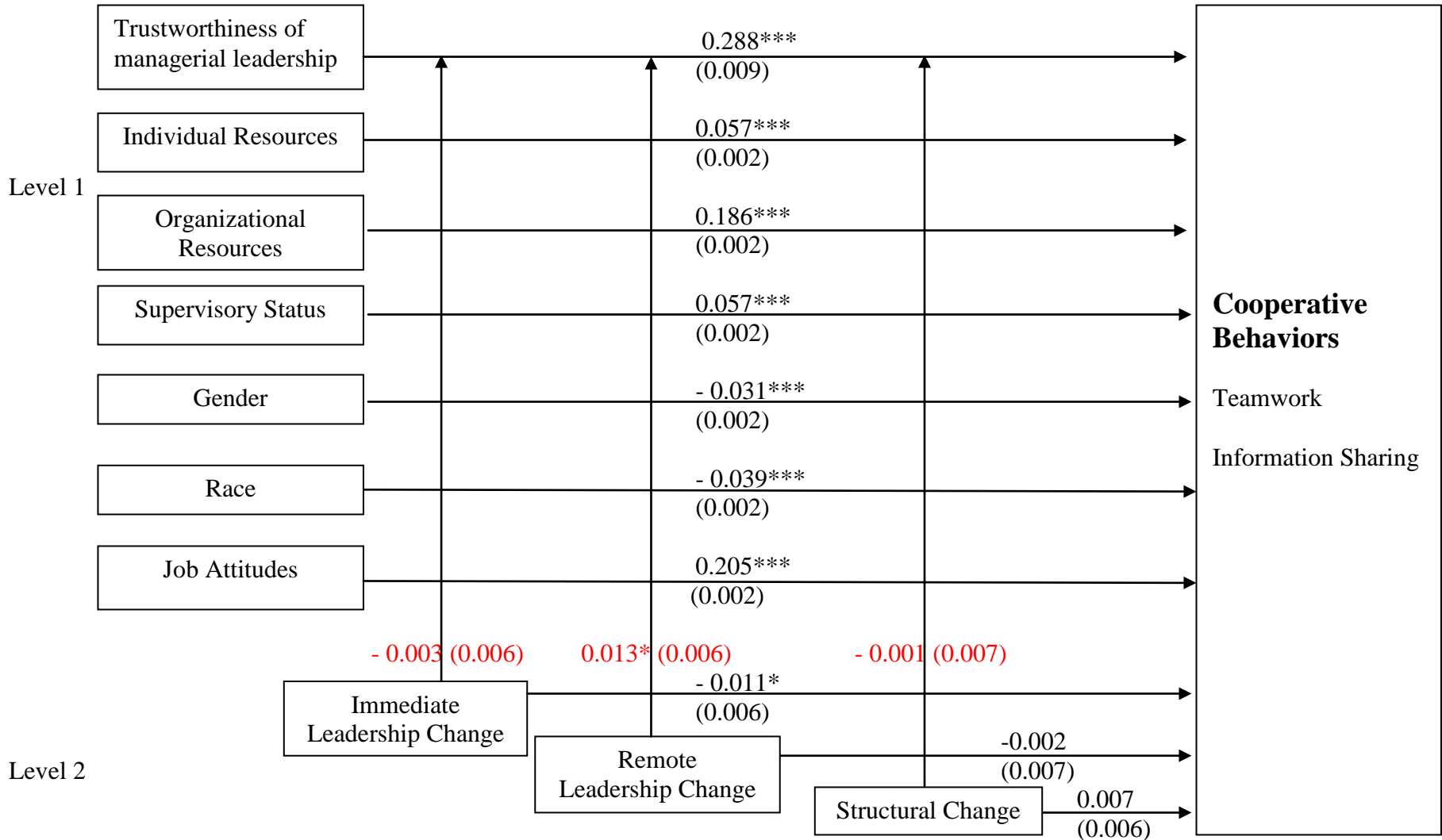


Figure 2. Recursive Causal Model of Job Attitudes



* p<.05, ** p<.01, *** p<.001, regression coefficients employ one tailed tests
 * Numbers in parentheses are standard errors.
 *Red numbers indicate cross-level effects of institutional factors

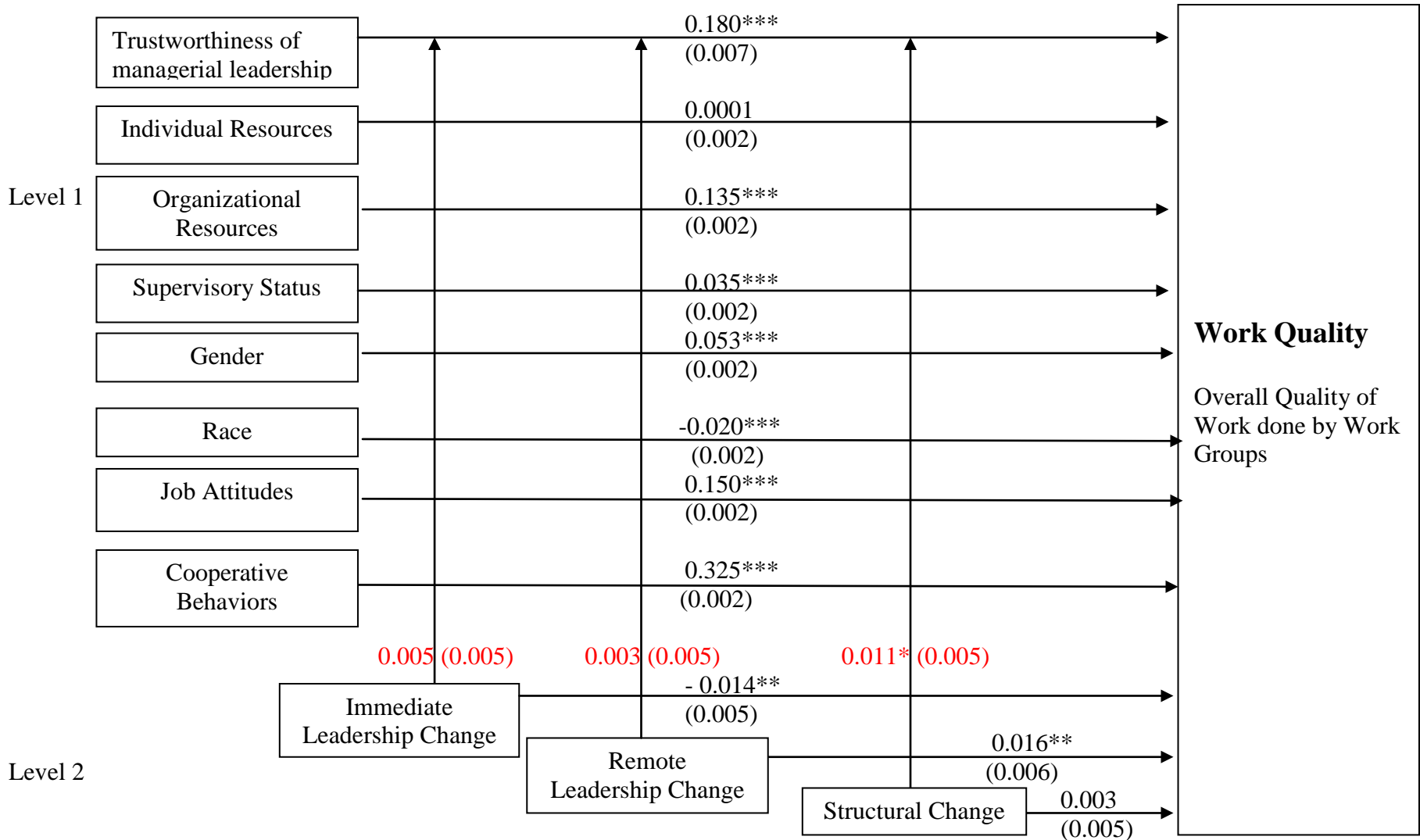
Figure 3. Recursive Causal Model of Cooperative Behaviors



* p<.05, ** p<.01, *** p<.001, regression coefficients employ one tailed tests

* Numbers in parentheses are standard errors. *Red numbers indicate cross-level effects of institutional factors

Figure 4. Recursive Causal Model of Work Quality



* p<.05, ** p<.01, *** p<.001, regression coefficients employ one tailed tests

* Numbers in parentheses are standard errors. *Red numbers indicate cross-level effects of institutional factors