

Parsing Public/Private Differences in Work Motivation and Performance: An Experimental Study

Gene A. Brewer*, **Gene A. Brewer Jr.†**

**The University of Georgia and Utrecht University; †Arizona State University*

ABSTRACT

This article echoes recent calls for public management research to focus on core questions and utilize multiple methods to advance the state of knowledge in the field. In this article, we call for more experimental research on the public/private distinction, which is a core public management research topic. We then conduct a pilot experimental study that provides new insights—and what seem to be major implications—about this important topic. Specifically, we study individuals' vigilance when performing work in a government funded research project compared with a business funded research project. Our results show that individuals are significantly faster, more accurate, and more vigilant when their work is funded by a government agency rather than a private business firm. Two major implications are (1) government provision of goods and services that require faster, more accurate, and more vigilant workers (e.g., airport security or emergency responders) may be superior to private provision, *ceteris paribus*; and (2) our participants in this study, who are college students, seem to perform better when working for government rather than for the private sector. This is heartening because, with the "quiet crisis" looming over government, many seasoned public servants will soon be replaced by these younger workers. The strengths and limitations of the study are discussed.

"If we knew what we were doing, it wouldn't be called Research."

A. Einstein

The recent global financial crisis and ongoing efforts to cope with terrorism and civil strife around the world are focusing renewed attention on core questions about the relationship between the public and private sectors in a free society. What are the relative merits of the two sectors, and what are their respective strengths and weaknesses in producing goods and delivering services for society? These questions have daunted social scientists for many years. A similar set of questions is confronting policymakers today: for example, should financial markets operate relatively unfettered from government control, should the lion's share of social services be provided by nongovernmental actors, and should private contractors perform critical missions in the war on terror? The paucity of empirical evidence on these important

The authors contributed equally to this article; they are grateful to Nash Unsworth for his assistance and three anonymous reviewers for their helpful comments. Address correspondence to the authors at cmsbrew@uga.edu and gene.brewer@asu.edu.

doi:10.1093/jopart/mur030

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issues, coupled with the urgent need for answers, has led to an era of ideological politics in which proponents of the political left and right have sought to answer these core research questions normatively. The ensuing debate has been bitter and counterproductive; it has hampered the political process and produced a flurry of ill-conceived public policies. What is sorely needed to break this ideological logjam is more, better research, and a strong bipartisan commitment to evidence-based policy. Fortunately, progress along these lines may now be within our grasp.

THE NEED FOR MORE, BETTER RESEARCH

Disappointment with the march of progress in traditional public administration research has been a major impetus for the emerging field of public management (Bozeman 1993; Perry 1996; Rainey 2009). Yet public management itself is in need of methodological improvement and refinement (Brudney, O'Toole, and Rainey 2000; Gill and Meier 2000; Kettl and Milward 1996). Observers have lamented the weak state of research in general. More specifically, they have complained about researchers' failure to focus on core research questions, poor conceptual development and measurement, use of weak or inappropriate research methods and designs, inadequate mentoring, lack of rigor in doctoral dissertation research, and insufficient funding for the research enterprise overall (e.g., see Adam and White 1994; Brewer et al. 1999; Garson and Overton 1983; Perry and Kraemer 1990).

In this article, we identify two of these themes that seem especially important and amenable to improvement: the need to focus on core research questions, such as the public/private conundrum which may have implications for the work motivation and performance of employees, and the need for stronger research methods in public management research—especially true experimental designs. We then mount a true experimental study that investigates the work motivation and performance of individuals working for a government agency compared with those working for a business firm. The results show that individuals working for a government agency perform a relatively mundane task faster, more accurately, and more vigilantly over time.

EXPERIMENTAL METHODS: A PROMISE UNFULFILLED?

Social science research methodology has largely developed over the past half century. Since the late 1960s, some researchers have optimistically called for an “experimenting society” that views “reforms as experiments” and utilizes experimental methods and demonstration projects rather than trial and error for public policymaking (Campbell 1969; Fitz-Gibbon 2004; Rivlin 1971, chap. 5; Sherman 2003). This idea has more recently been referred to as “evidence-based policymaking,” which implies that public policy should be based upon and informed by rigorously established empirical evidence. An important aspect of evidence-based policymaking is the use of scientific methods and rigorous studies such as randomized and controlled experimental trials to identify programs and practices that are capable of improving policy relevant impacts and outcomes.

Currently more than one million clinical trials have been conducted in medicine, which has firmly embraced the idea of evidence-based treatment, but only about 10,000 have been conducted to evaluate whether social programs achieve their intended purposes (Sherman 2003). Many of these trials are naturally occurring field experiments or other types of studies that do not meet the strict criteria of a true experimental research design. There are, therefore, far fewer true experimental studies and only a handful in the emergent field of public management research. In fact, over the past 15 years, we could only locate five

published studies meeting these criteria which are described below. Yet the potential for these types of rigorous, controlled studies is great. Researchers can utilize experimental methods to focus on policy or program-related attributes such as efficiency, effectiveness, and equity; organizational attributes such as public/private differences; and individual attributes such as work motivation and performance. Furthermore, researchers may find it possible to integrate these findings by generalizing from the individual level to the policy, program, and organizational levels if the research design is structured properly and sound judgment is used (Lauderdale, McLaughlin, and Oliverio 1990; March and Simon 1958).

True experimental designs are the strongest family of research designs because they can effectively isolate cause and effect relationships and eliminate most rival causes.¹ In a true experimental design, subjects are randomly assigned to either an experimental or control group, and the treatment (or purported cause) is introduced to the former. The result (or purported effect) is then measured in both groups and any difference between them is attributed to the treatment. Rival causes are eliminated through probability theory. Random assignment ensures that the two groups are statistically equivalent at the outset of the experiment, and by maintaining proper control, the researcher ensures that they remain so. The researcher can then conclude that any posttreatment difference between the groups is due to the treatment itself, which only the experimental group received. There are several variations on this basic scheme that meet the same strict criteria of randomization and control.

Some scholars, such as Campbell and Stanley (1966), Cook and Campbell (1979), and others have pointed out that various threats to validity can still intrude on true experimental designs unless control is strictly maintained. For example, such designs are more effective at mitigating internal rather than external threats to validity, history can pose a danger in long-running experiments, and any type of research design can be compromised by researcher bias or contamination. Nonetheless, true experimental designs are very strong and can achieve high levels of internal validity. This is why some researchers refer to them as the “Cadillac” of research designs (e.g., see Henshel 1980).

There are many drawbacks in utilizing true experimental designs in field settings. Researchers have difficulty establishing and maintaining control in a dynamic, politically charged environment, isolating the purported cause and effect, attending to the ethical problems that creep into experimental research on human subjects, and “speaking truth to power” when the results of an experiment prove counterintuitive or embarrassing to public officials, some of whom may have commissioned the research. The problem with utilizing true experimental designs in practical or applied knowledge areas is essentially one of trade-offs between internal and external validity. Type 1 errors (seeing mirages) are usually minimized, whereas Type 2 errors (missing mountains) more often occur. In some areas of public policy, however, the needs are reversed: high reliability organizations such as airport security, nuclear power plants, and NASA space missions are expected to detect and cope with many false positives in their effort to minimize the possibility of a rare oversight or accident that could produce catastrophic results.

In addition, conventional wisdom suggests that the experimental method is too far removed from reality and too difficult to implement in practical or applied fields, thus explaining the dearth of experimental studies in the public management field to date.

1 Three families of research designs are discussed in the literature: nonexperimental or preexperimental designs, quasi-experimental designs, and randomized or true experimental designs which are the most rigorous (e.g., see Campbell, 1969; Clark, 1987; O’Sullivan, Rassel, and Berner 2008).

But quite a few experiments have been conducted in the adjunct fields of psychology, engineering, law, and medicine, which at least partially debunks this explanation. Moreover, we contend that public management researchers should try to grow the field's knowledge base by being more disciplined and thinking more creatively about how true experimental designs can be utilized to pry into core research questions.

Here, we demonstrate how this can be done by utilizing a true experimental design to probe the alleged public/private distinction, which is central to theory and practice in our field. For example, if there is no sustainable distinction between public and private organizations, there is little need for a separate field of scholarship on public management (it could be subsumed by general management studies), and in the world of practice, in the absence of market failures, there would be little need for public organizations to provide goods and services for society (this could presumably be done by private organizations) (Bozeman 2004; Musgrave 1959; Rainey and Bozeman 2000; Rainey et al. 1976). In addition, this experiment provides insight on the work motivation and performance of individuals working in the two sectors. Many studies have investigated possible sectoral differences in this regard, and they have tended to produce a bevy of inconsistent findings which beg further research (for a review of the evidence, see Rainey 2009, chap. 9–10). On the whole, these studies have been quite useful for the development of theory and practice, but they have not resolved fundamental questions about the relative advantages of public and private sector organizations or the work motivation and performance of the employees who work within them. Moreover, as far as we can determine, none have employed true experimental methods and designs.

In the next few sections, we report on a study that helps to fill this gap in empirical research on public/private differences. This study provides evidence that individuals tasked with governmental work perform comparatively better than individuals tasked with the same type of work for a business firm, at least in the short term. These findings are especially interesting since the work itself is rote and without any apparent meaningful content.

THE IMPORTANCE OF TASK VIGILANCE

As mentioned previously, research on the relationship between the public and private sectors has important implications for the study and practice of public management, including the perennial question of whether government or business should be providing the lions-share of goods and services for society (Bozeman 2004; Rainey and Bozeman 2000; Rainey et al. 1976). Our contention is that part of the answer may lay with the individuals who work for and interact with the two sectors (government agencies and business firms). Certainly their motivation has been identified as one of the “big questions” of public management (Behn 1995, 318–9). Moreover, employee performance is a key concern that is receiving increased attention in the public sector and elsewhere (Brewer 2008, 2010; Bouckaert and Halligan 2008).

One important question is whether individuals perform differently when working in government and business contexts. That is, does government—or business—provide a superior institutional basis for inspiring employee motivation and triggering higher performance? Such differences might be a decisive factor in determining whether certain tasks are assigned to the public or private sectors (Rainey et al. 1976; Rainey and Bozeman 2000; Bozeman 2004). Existing schemes for dividing responsibilities between the sectors are based on some overly simplistic assumptions about human behavior in bureaucratic and market systems, such as the self-interest maxim which assumes that individuals are self-serving

and tend to be rent seekers or free riders. These stereotypes implicitly suggest that public and private sector employees are alike; they merely respond to the incentives they are offered and the opportunities and constraints of the organizations in which they work. Accordingly, public employees are often perceived as slackers who do not show much initiative or perform their jobs very well, in part because they do not have incentives to perform well and because public organizations tend to be hidebound bureaucracies. On the other hand, public employees are sometimes perceived as jack-booted thugs who go out of their way to hijack the public interest and inflict harm on citizens, in part because public organizations are thought to be powerful, pervasive, and unresponsive to the citizenry. Obviously, these bureaucratic stereotypes are inconsistent and may only describe extreme cases; the vast majority of public employees may be properly motivated, productive, and mindful of the public interest. Yet the pervasiveness of these stereotypes spotlights the fact that researchers have not yet cracked this core question about public/private differences.

Another reason for asking this question is the often-cited “quiet crisis” in government. A mass exodus of experienced civil servants may occur over the next few years. It is therefore vitally important to know how their replacements will respond to the challenge of performing government work so that appropriate recruitment and retention strategies can be developed. Accordingly, public management scholars need to develop a better understanding of work attitudes and behavior in an age of government contracting and privatization where many individuals may receive their paychecks from private firms but be assigned to perform what have traditionally been perceived as public sector jobs, such as banks administering bailouts for other banks, accounting firms regulating investment and security firms on Wall Street, insurance companies providing public health coverage, and private security firms operating in Iraq and Afghanistan. Some public employees, in turn, may be tasked with performing work that has traditionally been carried out by private sector firms such as providing airport security, building vital infrastructure in third world countries, and performing essential services in the wake of a natural disaster. Together these challenges underscore the need for researchers to develop a better understanding of whether—and how—sectoral differences affect the work motivation and performance of individuals.

In the current study, we focus on an aspect of performance called task vigilance which is operationally defined as persistence on an ordinary task over an extended period of time. Task vigilance requires speed and accuracy as an individual must try to maintain a high level of performance over time. To measure task vigilance, we implemented a version of the psychomotor vigilance task (Dinges and Powell 1985; Unsworth et al. 2009). In the experiment, participants are seated in front of a computer screen and asked to press the space bar each time they observe a time-counter begin. The time-counter begins at irregular intervals so participants must pay close attention. By observing the time-counter, they receive feedback on the speed and accuracy of their responses. The concept of task vigilance thus includes elements of speed and accuracy, as well as persistence. It also involves maintaining attention and utilizing feedback, although this latter element is not measured directly. The task itself is rather mundane and continues for 10 min. Participants’ performance tends to increase early on as they learn how to perform the task and then diminish over time because of fatigue.

Figure 1
The Public/Private Distinction in Work Behavior

	Public Sector Work	Private Sector Work
Public Sector Employee	Public Sector Worker	Business Regulator
Private Sector Employee	Government Contractor	Private Sector Worker

SOME APPLICATIONS IN PUBLIC MANAGEMENT RESEARCH

We believe there are considerable opportunities for flaying out the knowledge base of public management by stubbornly focusing on core research questions, utilizing multiple research methods—especially true experimental designs, and recognizing the value of incremental improvements and small contributions to the state of knowledge as it inches forward. Weaker research methods and designs, such as case studies, cross-sectional surveys, naturally occurring field experiments (or quasi-experiments), etc., have been widely utilized and have contributed greatly to the study of core public management questions, whereas experimental research methods and designs are perhaps the most under-utilized type of research.²

Our review of the literature found only a handful of true experimental studies in public administration and related fields, of which public policy and public management are primary contributors. The *Journal of Public Administration Research and Theory* published a special issue on the use of experimental methods in public management research in 1992. The authors reviewed the few experimental studies that had been conducted at that time, speculated on some reasons why researchers were not employing those techniques, and called for more experimental research in the future (e.g., see Bozeman and Scott 1992). Despite this early effort to stimulate such research, our review found only five true experimental studies conducted by public management researchers and published in journals that are directly associated with the field over the past 15 years. These include studies by Landsbergen et al. (1997), Scott (1997), Scott and Pandey (2000), Knott et al. (2003), and Nutt (2006).³ The latter study focused on public/private differences, but the emphasis was on decision-making processes. So far as we can tell, no such studies have focused on public/private differences in employee work motivation and performance.

2 Underlying social science research are four paradigms or views of reality that are either consciously or unconsciously applied: positivism, post-positivism, critical theory, and constructivism. This article seeks to advance empirical research in the positivist tradition.

3 Several other studies have been billed as experiments but seem to lack some essential features of the true experimental design, such as random assignment of subjects to treatment and control groups; comparison of two treatment groups, alternating treatments and non-treatments (including placebos) among subjects; or similar experimental manipulations (e.g., see the experiment conducted by Moynihan 2006).

We are more interested in understanding public/private differences in the work motivation and performance of individuals who are employed by, and carry out the core tasks of, government and business. Figure 1 fleshes out these possibilities in oversimplified form. As Figure 1 shows, two basic dimensions are needed to accurately portray the complexity of work in the modern public and private sectors because they have become somewhat blurred and employees in each sector do quite a bit of work across sectoral boundaries (Bozeman 2004; Freeman and Minow 2009; Rainey 2009; also see Dahl and Lindblom 1953 and Wamsley and Zald 1973 for theoretical context).^{4,5} The first dimension, public versus private sector work, refers to who is sponsoring and funding a task, and which sector—public or private—that work is normally performed by. This is the dimension we test in the current study. The second dimension consists of the individual's employment sector. Employees presumably choose a preferred sector and may become vested in it over time. The two-by-two matrix also reveals the existence of two hybrid types of employees: government contractors and business regulators. We propose expanding the study in the future to examine these types, thus providing insight about the motives and behavior of individuals that work across sectoral boundaries.

In the present study, we investigate whether the institutional basis of an organization affects the work motivation and performance of its employees. There is a prevailing belief that public organizations are less efficient than private organizations. This is in part because government agencies are dependent on legislative budget allocations rather than market forces and thus have an incentive to overconsume and overproduce (Dunleavy 1991; Niskanen 1971, 1973; Tullock 1965). This focus on organizational incentives—or lack thereof—is supplemented by theories of bureaucratic behavior that contend government employees are self-interested and self-serving and, thus, have some perverse incentives to guide their behavior. These incentives can lead to starkly different predictions. For example, public choice theory suggests that government employees may be free riders or rent seekers. These individuals may be slackers who do not show much initiative or perform their jobs very well, or they may be jack-booted thugs who go out of their way to inflict harm on citizens and hijack the public interest as government conspiracy theories would suggest (for similar predictions, see Brehm and Gates 1997). What these theories have in common is that they almost always predict suboptimal performance by government employees.

On the other hand, there is evidence that some public organizations are more effective than some private organizations. There is also an emerging theory of public service motivation (PSM) that suggests public employees on the whole may be more properly

4 Administrative reforms implemented over the past 35 years have blurred the public/private distinction and made it more difficult for researchers to pigeonhole organizations in any one category. Governments everywhere are contracting out many of their functions and service delivery is being accomplished through a complex web of governmental and nongovernmental organizations and actors. Today government, business, and nonprofit employees often work side-by-side and perform similar tasks. These sector-blurring reforms have created havoc—at least in the world of organizational taxonomists (see footnote 5).

5 Wamsley and Zald (1973) advanced an organizational taxonomy in which public versus private provision of ownership and funding were the key variables. The resulting framework described public organizations as those owned and funded publicly and private organizations as those owned and funded privately. This two-by-two framework also identified two hybrid types of organization: those that are publicly owned but privately funded and those that are privately owned but publicly funded. Bozeman (2004) articulated a more sensitive measure of “publicness” based on the extent to which an organization is influenced by political authority. His theory suggests that, on a continuum ranging from purely public to purely private, most organizations achieve some degree of publicness. Bozeman (2004) further argued that organizational publicness is multidimensional and complex and cannot really be thought of as one element or summarized in a single statistic.

motivated and higher performing than public choice theory suggests. Rainey and Steinbauer (1999) laid part of the groundwork for this counter-narrative by pointing out that negative stereotypes of public organizations may tend to overshadow their responsiveness and effectiveness in some instances. Indeed, various surveys and assessments have shown that some public organizations rank very high on efficiency, effectiveness, and customer satisfaction when compared with most private sector organizations (Rainey 2009, Chap. 6). This more positive assessment of public organizations is buttressed by the theory of PSM which suggests that some public employees are strongly motivated to serve others and protect the public interest and are thus more likely to perform well than other individuals. Perry and Wise (1990, 368) defined PSM as “. . . an individual’s predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations” and predicted that the concept is positively related to performance (Perry and Wise 1990, 370–371). Brewer and Selden (1998, 417) added that PSM is “. . . the motivational force that induces individuals to perform meaningful public, community, and social service” and explicitly linked the concept to higher individual and organizational performance (Brewer and Selden 1998, 425). These authors did not predict that government employees would perform better than business employees; rather, the major implications of their work are that the concepts of work motivation and performance are somewhat different in the two sectors and that government employees are not necessarily inferior. This of course pushes the question of public/private differences to the forefront, and the theory of PSM provides some theoretical infrastructure to help explain any such differences that may exist.

On balance, however, many members of the public administration community probably embrace Goodsell’s (2004, chap. 5) view that public employees are “ordinary people” and no different from other citizens (if not the particulars of his polemic on bureaucracy).⁶ This innocuous view of public employees suggests a null hypothesis that predicts no difference in the work motivation and performance of public and private sector employees, especially when other factors are held constant, such as government red tape or business ethical lapses. This more balanced view of public/private differences frames the current study.⁷

DATA AND METHODS

Participants

Undergraduate students from the University of Georgia volunteered to participate in our study in exchange for partial credit toward a research appreciation requirement. Each participant was tested individually in sessions that lasted approximately 30 min. The participants spent another 30 min responding to a post-experimental questionnaire and going through debriefing. A power analysis was used to determine the optimum number of subjects needed for a fully randomized two-group experimental research design that would

6 Goodsell’s view of bureaucrats seems to be evolving in light of scattered but noteworthy evidence that public employees on the whole are more civically and politically engaged and more willing to give time, blood, and money than other citizens (Brewer 2003; Houston 2006; Jensen et al. 2009). He re-titled the fifth chapter of his polemic from “Bureaucrats as Ordinary Citizens” (3rd ed.) to “Looking Closer at Those Bureaucrats” (4th ed.).

7 Here we have offered several different explanations for the work motivation and performance of government employees. Clearly all—and possibly more—may work in concert. Perhaps the public sector has multiple types of employees and perhaps the relative frequency of these types may vary as a function of the agency or branch of government (i.e., employees who Teach for America probably differ from those regulating industry or serving in the military). Furthermore, individuals may have mixed motives that include degrees or shades of self-interest, altruism, etc.

provide confidence in our findings at the 95% level. Accordingly, 40 volunteers were equally distributed into one of two between-subject conditions. The participants were randomly assigned to either the government or business condition based on their appointment time at the laboratory. This was done by alternating the assignment of each new participant. Four participants were excluded from the following analyses (and replaced) for not remembering the nature of the manipulation in a post-experiment interview. That is, they did not remember who was funding the research in their trial.

Materials and Procedure

We used the psychomotor vigilance task to investigate if our manipulation of sector funding made a difference in participants' cognitive performance (Dinges and Powell 1985; Loh et al. 2004). This task required the participants to keep in mind a trivially easy task goal over the course of the experiment. The participants' specific goal was to press the space bar on a computer keyboard anytime a visually displayed counter began increasing on the computer monitor. The counter was time locked and after participants pressed the space bar, the counter stopped and participants could gauge how quickly they responded in milliseconds. This provided the participants with feedback. Then, their reaction time was reset to .000 and a new trial began. The computer randomly delayed 2–10 s before initiating the next count up so participants could not predict the start of counting. The task carried on for 10 min in this fashion and, on average, participants usually completed 90 trials. The instructions for how to perform the ongoing task were initially read from the computer monitor by the participants so as to standardize the trials.

At the very beginning of the experiment, participants read that the research they were about to take part in was being funded by either a "government agency" or a "business firm." Other than this initial difference in the instruction phase, all participants encountered the same conditions in the experiment. The treatment was randomly alternated based upon the participants' time of arrival at the laboratory, thus ensuring that the two treatment groups would be roughly equivalent. After completing the psychomotor vigilance task, participants completed a brief questionnaire that included basic demographic items (age, race, gender, education, income, etc.), a PSM questionnaire, a 10-item personality inventory, and political affiliation and ideology questions. At the end of the survey, two questions were asked: one question probed the participants' recall of the independent variable of interest ("Who funded this research?") and another question asked the participants whether they felt the funding source affected their performance. These final two questions were useful for making sure that all participants included in the following analyses actually understood who was funding the research and would potentially be vulnerable to the independent manipulation of sector funding. Interestingly, out of the 40 people who participated in the experiment, only 3 claimed that the nature of the funding agency had any impact on their performance. Although most participants reported no effect, the results clearly demonstrate that this manipulation had a pervasive effect on participants' attention on the psychomotor vigilance task.⁸

⁸ This finding is consistent with past research on PSM. The concept cannot be observed and measured directly. Rather, researchers normally ask individuals to report their own levels of PSM via Likert-type responses to survey items. This would seem to invite self-reporting bias and inflated responses as individuals often try to portray themselves in socially desirable ways. Yet past research shows that individuals are not very good judges of their own motives and behavior when it comes to PSM. Rather, public servants tend to view themselves as no different from ordinary citizens, and they tend to understate rather than overstate their public-service related motives and deeds.

RESULTS AND DISCUSSION

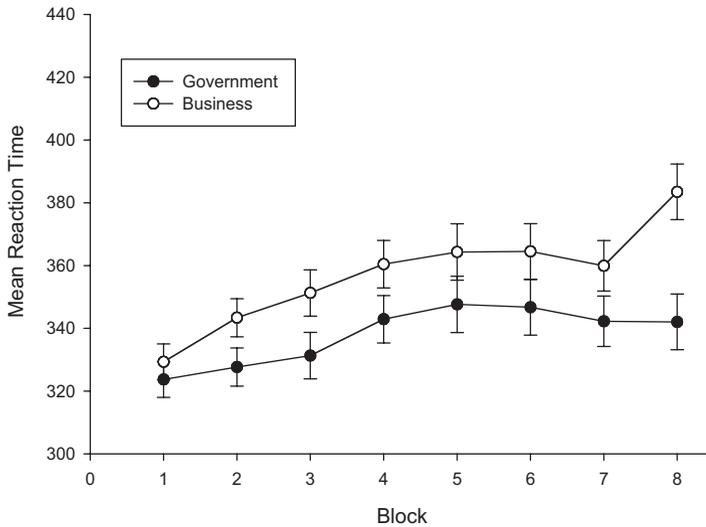
Across the two groups of participants tested in this experiment, there were no statistically significant differences in age, race, gender, education, income, political affiliation, ideology, PSM, and personality (see table 1). Seemingly, characteristics which could have potentially affected task performance were equally distributed between conditions. The trials of the psychomotor vigilance task were divided into 8 blocks consisting of 10 trials per block which were ordered in time. Dividing performance using this technique allows researchers to easily assess changes in task vigilance across the entire procedure (see Unsworth et al. 2009, for additional details). A two-by-eight (public or private sector across eight blocks of ten trials) mixed-factorial analysis of variance on the participants' reaction times in the psychomotor vigilance task was carried out (see figure 2). All reaction times were trimmed at 2.5 standard deviations within subjects and within blocks before running the foregoing analyses (i.e., following standard procedure in cognitive psychology experiments, if a participant had a response time which was significantly longer than their average for that block, it was removed). These long response times would skew the distributions of reaction times, thus violating one of the basic assumptions of analysis of variance, which calls for normally distributed dependent measures. Although it is useful to disregard these aberrant responses when estimating a statistical model of performance which relies on distributional assumptions, psychologically they are still indicative of brief lapses of attention where participants momentarily lost focus on their task goal. We therefore compared the incidence of these lapses in the two groups. Individuals in the government condition had fewer lapses of attention overall than participants in the business condition $t(38) = 2.22, p < .05$. When taking sector into account, participants in the government condition responded faster than those in the business condition, $F_{1,39} = 4.10, p < .05, \eta^2 = .10$. Pooling over sector, as the experiment progressed, reaction times to the counter also increased, $F_{7,266} = 16.87, p < .001, \eta^2 = .31$. Most importantly, participants in the government group

Table 1
Characteristics of Sample

	Government	Business	Combined
Age	18.9 (0.26)	18.95 (0.21)	18.93 (0.16)
Gender (female)	7	6	13
Years in college	1.38 (0.21)	1.14 (0.20)	1.26 (0.14)
Years of work experience	2.15 (0.32)	1.81 (0.40)	1.98 (0.25)
Public service motivation	3.21 (0.10)	3.39 (0.11)	3.30 (0.07)
Extraversion	4.95 (0.33)	4.75 (0.25)	4.85 (0.21)
Agreeableness	4.93 (0.30)	5.38 (0.27)	5.15 (0.20)
Conscientiousness	5.23 (0.34)	5.30 (0.33)	5.26 (0.23)
Emotional	5.18 (0.26)	4.95 (0.36)	5.06 (0.22)
Openness	5.63 (0.29)	5.10 (0.31)	5.36 (0.21)
<i>N</i>	20	20	40

Note: All values reported in this table are mean (SE). None of the intergroup differences are statistically significant (smallest $p = .218$). Age was measured in years. Gender represents the number of females in the sample. Years of college represent the number of years students have been enrolled in college. Years of work experience represent the number of years students had held jobs. PSM is the mean of the first 13 items in the PSM scale. The five personality variables represent mean scores on the Big Five personality characteristics.

Figure 2
Mean Reaction Time with SE Bars Plotted across Eight Blocks for Government (closed circles) and Business (open circles)



remained more vigilant over the task goal across the eight blocks, $F_{7,266} = 2.91, p < .01, \eta^2 = .07$.

Together, these results indicate that when participants were informed that the research they were taking part in was funded either by a public or private sector sponsor—either a government agency or a business firm—their performance changed in systematic and reliable ways. Individuals who believed that they were taking part in research which was funded by the government maintained a higher level of vigilance across the whole task, experienced fewer attention lapses, and responded faster overall whenever the counter started increasing. The psychomotor vigilance task measures a very simple cognitive ability: keeping a goal in mind. The behavioral results of doing so constitute an important element of performance. It has been demonstrated that this task is easy to administer and brief. Also, the task has good measurement qualities which reliably indicate lapses of attention and can demonstrate differences in the cognitive abilities of sleep deprived individuals (Drummond et al. 2005; Loh et al. 2004). We can only speculate on how these results might be affected by assigning tasks of more importance and gravity, but extant theory and empirical research on PSM suggests that the difference gap between the public and private sectors might increase. That is, as individuals in the government condition begin performing *meaningful* public service, their work motivation and performance might ramp up.⁹

⁹ This finding is also consistent with past research on PSM. Brewer and Selden (1998) showed that concern for the public interest was an important factor in U.S. federal employees' decision to blow the whistle on illegal or wasteful activities in government.

We view these results as an initial set of findings related to peoples' perceptions of sector differences—nothing more or less. It remains to be seen whether these findings can be generalized to other cognitive tasks which take into account other demands (i.e., memory, judgment and decision making, or planning tasks). These types of tasks are more explicit in nature and may or may not show such dramatic effects across the board. Also, effect sizes found in this experiment are somewhat modest, and it remains to be seen whether these effects can be replicated across different populations and laboratories over time. Nevertheless, we feel that this was a successful application of true experimental techniques in public management research. The results make several fundamental claims about individuals' perceptions of sector differences which could dovetail nicely with additional findings from case studies, cross-sectional designs, survey research, and other types of public management research. Obviously, the strongest approach is one that relies on multiple methods to piece together a coherent representation of individual motives and behavior, and their role in sector differences.

CONCLUSION

This study has utilized a completely randomized true experimental research design to show that individuals respond differently when they believe they are working for a government agency rather than a business firm. When individuals believe their work is sponsored and funded by a government agency, they perform significantly faster, more accurately, and more vigilantly. We thus conclude that there is a sectoral difference affecting the motivation and performance of individuals working for government and business: specifically, those working for a government agency perform significantly better than those working for a business firm, *ceteris paribus*. These findings comport well with positive notions of the state and they tend to support the theory of PSM.

Our results, although still preliminary in nature, suggest that the public sector may have some advantages in organizing and funding the work of society, as compared with the private sector. The presence of public institutions and their role in funding certain tasks appears to have a very positive effect on the work motivation and performance of employees. The implications of these findings are potentially far reaching and include the possibility that public provision of more goods and services might increase the level of economic efficiency for society overall. At a minimum, the findings suggest that public employees are more proficient at performing certain tasks than their business counterparts. However, we will not make such far-reaching inferences because the focus of attention in the nearer term should be on replicating and extending these findings. The true experimental method provides an appropriate vehicle for such work, as explained below.

Campbell (1969) and others have argued that policymakers and researchers should be using experimental methods to pilot test social policy and answer other important research questions. We echo and extend this call—contending that experimental methods should be used more often in public management research. We also advocate multiple method approaches that attack research questions aggressively, angle in from different epistemological perspectives, and utilize different methodological tools. This study has demonstrated how an experimental study can be leveraged to improve our knowledge about a core research question in public management: the public/private distinction. Path-breaking

research studies often provide answers to the questions being asked and provide new insights about the topic of study in general, but perhaps more important, they tend to raise a bevy of new research questions that themselves seem urgent and compelling. We believe that is the case here.

It is more difficult to explain why more public management researchers have not been utilizing these techniques. Certainly they are not beyond the methodological reach of most researchers, and as we have argued, they are not too far removed from reality. Moreover, these techniques do not necessarily impose ethical problems simply because they involve experimentation with human subjects. Rather, we believe public management researchers need to work through these problems and focus more intently on core research questions such as the public/private distinction, be innovative in their approach to answering these questions, and show discipline when designing and carrying out their research. Public administration academic programs and funding agencies might also play important roles in encouraging experimental research once researchers have demonstrated some interest and acumen in utilizing these techniques. In the longer term, researchers will need funding and other types of resources for conducting experimental trials, such as access to laboratories with steady streams of research subjects and trained methodologists who specialize in experimental analysis. Eventually true experimental studies will need to be integrated into multiple method approaches to form comprehensive research programs that can answer basic theoretical questions and perform action research, supplying requisite knowledge to meet the ongoing needs of scholars, policy-makers, and practitioners in the field. The true experimental method is the strongest research design available, and it provides a nice complement to ongoing research strategies.

Our call, then, is for public management researchers to let the revolution begin by using old-fashioned ingenuity in applying true experimental methods. These methods seem especially appropriate for prying into individual-level phenomena such as work attitudes and behavior, PSM, the exercise of discretion, and other topics of interest. They also hold promise for group- and organization-based research. One problem researchers must face is the well-known ecological fallacy—researchers cannot generalize individual-level findings to the group or organization levels, and the reverse ecological fallacy—researchers cannot generalize group- or organization-level findings to the individual level. Cook (2005) explains some of the unique opportunities and challenges of using cluster-based rather than individual-level experimental designs to overcome these problems. In these cases, experimental research has the potential to substantially increase our understanding of individual and organizational phenomena, but like other less rigorous research methods, it also has some drawbacks.

We acknowledge several potential weaknesses of this study. First, public perceptions of government and business may change over time; as a result, our findings may be time bound or temporal in nature. Second, if the trials were extended beyond the standard 1-h session, the sectoral differences we have documented might diminish or disappear over time. Certainly participants would tire, mature, and possibly burn out in their longer term careers in government or business. We are keenly interested in generalizing our findings over the long-term so this is a crucial question. Third, there are several different ways to interpret our findings. For example, we suggest that individuals may feel inspired to work for government and therefore perform better. These individuals may, however, feel

intimidated by government and fear being punished if they do not perform well—thus accounting for their higher performance. More research is needed to clarify their motives.¹⁰ Fourth, the experimental method is very powerful but limited in scope. Multiple method research is needed to better explain the context and implications of our findings. Nonetheless, it should be pointed out that much important information can be gleaned from experimental research that is not accessible through other methods; experimental work is therefore essential and complimentary to the more traditional methods employed in the field.

One question addressed in this study—which is central to the public/private distinction—is whether particular bundles of goods and services are best delivered by government, the private sector, public-private partnerships, nonprofit organizations, or other hybrid institutions (Rainey et al. 1976; Rainey and Bozeman 2000; Bozeman 2004). This study suggests that government institutions and public provision of goods and services may have certain advantages—specifically in inspiring workers to perform faster, more accurately, and with more vigilance. We therefore believe it is important to continue this line of work.

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¹⁰ One reviewer pointed out that it is not always desirable for public employees to perform vigilantly. For example, tax auditors may be over-vigilant and lose public support. The reviewer also pointed out that Milgram (1974), in a well-known set of experiments, showed that individuals are generally obedient to authority; they tend to follow orders and rarely question authority figures. The reviewer's points are well taken and provide markers for future research. We cannot investigate them in the present study, however, because individuals are performing a rote task with simplistic accountability mechanisms; there are no apparent ethical or moral implications and no apparent impact on the public interest. We have chosen this “deliberate artificiality” on purpose: utilizing a simplistic task, which has no governmental or business predilections, makes our test more even handed and our findings more valid. This technique is often used in the natural sciences to discover regularities that are not as clearly visible in turbulent, real world settings (Henshel 1980).

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