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Experimental Evidence on the Relationship between Public Service Motivation and Job Performance

This article responds to recent calls for experimental research into the relationship between public service motivation (PSM) and job performance. The author conducted a field experiment with a sample of nurses at a public hospital in Italy to investigate the interplay between job performance, PSM, and two conditions: exposure to contact with beneficiaries and self-persuasion interventions. Both treatments had positive effects on participants' persistence, output, productivity, and vigilance. Baseline PSM strengthened these positive effects. Moreover, both conditions caused an increase in PSM that partially mediated the positive effects of beneficiary contact and self-persuasion on job performance. The implications of the experimental findings for theory and practice are discussed.

In this study, we aim to shed more light on the relationship between PSM and job performance using an experimental research design.

Since Perry and Wise defined public service motivation (PSM) as “an individual’s predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations” (1990, 368), PSM research has blossomed into a vibrant field of study (Perry and Hondeghem 2008). Over time, scholars have proposed three major variations on the same theme (Perry, Hondeghem, and Wise 2010). Brewer and Selden reframed the concept of PSM as “the motivational force that induces individuals to perform meaningful ... public, community, and social service” (1998, 417). Along the same lines, Rainey and Steinbauer referred to PSM as a “general, altruistic motivation to serve the interests of a community of people, a state, a nation or humankind” (1999, 20). A more recent definition by Vandenberghe encompassed “belief, values and attitudes that go beyond self-interest and organizational interest, that concern the interest of a larger political entity” (2007, 547).

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Since its inception, PSM research has incorporated the (often unstated) assumption that PSM may have a positive effect on performance. Over the last two decades, the effect of PSM on both job and organizational performance has become a highly researched topic in public administration studies (e.g., Brewer 2010; Petrovsky 2009; Ritz 2009). However, despite a growing body of literature suggesting that PSM may boost performance, causality remains unclear because of the lack of experimental evidence (Wright and Grant 2010). In this study, we aim to shed more light on the relationship between PSM and job performance using an experimental research design. We begin by reviewing the literature addressing the PSM–job performance link. We then illustrate our research questions

and hypotheses. We go on to describe the field experiment that we conducted to test our hypotheses and conclude with a discussion of our findings and their implications for theory and practice.

Public Service Motivation and Job Performance

In their seminal article, Perry and Wise (1990) argued that individuals with greater public service motivation are likely to perform better in public sector work. Public sector jobs, the argument goes, are characterized by attributes such as high task significance, giving public service–motivated individuals more opportunities to fulfill their values of compassion, self-sacrifice, and commitment to the public interest and policy making, thus resulting in more intrinsic motivation compared to private sector work.

Since Perry and Wise’s 1990 article, a handful of scholars have investigated the link between job performance and PSM or closely related constructs. A first typology of studies explored the direct relationship between PSM and job performance. Based on cross-sectional survey data from some 10,000 U.S.

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federal employees, Naff and Crum (1999) found a positive association between PSM and self-reported individual performance ratings. This result was partially confirmed by a subsequent study by Alonso and Lewis (2001) using the responses of some 35,000 federal white-collar employees to the 1991 Survey of Federal Employees and the 1996 Merit Principles Survey. Like Naff and Crum (1999), Alonso and Lewis (2001) found a positive association between PSM and self-reported performance ratings in the 1996 data set; however, no significant relationship between valuing service to others and performance appraisals was evident in the 1991 data set. Moreover, the association between PSM and grade level turned out to be negative in the 1991 data set and not significant in the 1996 data set. While previous studies relied on self-reported performance data, a more recent article by Andersen and Serritzlew (2012) shed light on the association between commitment to the public interest—one of the four dimensions of PSM (Perry 1996)—and actual behavior in a sample of 556 Danish physiotherapists in private practice. Compared to their colleagues, physiotherapists self-reporting stronger commitment to the public interest tended to have a higher percentage of disabled patients. According to the authors, the percentage of disabled patients can be viewed as a proxy for individual performance—in terms of contribution to society—because disabled patients are more needy but less financially lucrative and more time-consuming to treat than ordinary patients.

A second typology of studies investigated the relationship between PSM and job performance as mediated by other variables. Using a sample of 205 public health care employees, drawn randomly from three public organizations in three states and at three levels of government, Bright (2007) found a positive association between PSM and self-reported performance; however, this relationship became insignificant when person–organization fit was taken into account. Unlike Bright, Leisink and Steijn's (2008) analysis of a sample of 4,130 Dutch public employees, at all government levels and in different types of services, found that person–organization fit did not mediate the association between PSM and three performance-related outcome variables (commitment, willingness to exert effort, and perceived job performance). A study by Vandenabeele (2009) on data from the Flemish civil service detected both a direct relationship between PSM and self-reported performance and an indirect association mediated by job satisfaction and normative and affective commitment.

A third typology of studies shed light on the relationships between PSM and job performance, although this literature does not explicitly employ these two constructs. Using 1989 and 1998 data from the General Social Survey, Frank and Lewis (2004) found a positive association between doing an interesting job that allows one to help others and self-reported work effort. This effect did not appear to differ between public and private sector workers. Based on survey data from a sample of 1,538 senior managers in U.S. local government jurisdictions with populations of more than 50,000, Moynihan and Pandey found that PSM was positively correlated with reported performance information use, “a form of behavior that is a logical contributor to both higher individual and organizational performance” (2010, 859).

Purely theoretical studies represent a fourth typology of research into the relationship between PSM and job performance. Besides the aforementioned articles by scholars of public administration

(e.g., Perry and Wise 1990), this category includes an economic paper identifying the “conditions under which government bureaucracy can better obtain PSM motivated effort from employees than a standard profit maximizing firm” (François 2000, 275). Provided that PSM exists, the argument goes, government employees should be more willing to employ effort out of concern for the impact of public work on valued social services compared to their private sector counterparts.

These four streams of research certainly contribute circumstantial evidence to the question of whether PSM fosters superior job performance. However, most of this literature relies on observational (i.e., nonexperimental) research designs, in which investigators observe subjects and measure variables of interest without randomly assigning treatments to the subjects. Observational research design—which include cohort, cross-sectional, and case control studies—are well suited for testing theoretical predictions in a broad range of populations but fall short with regard to internal validity (McGrath 1981). Reverse causality and omitted variable bias are the two most concerning threats to the internal validity of extant research into the effects of PSM on job performance, which is based primarily on cross-sectional data. Randomized, controlled experiments are best suited to address these two potential pitfalls (Shadish, Cook, and Campbell 2002).

Research Questions and Hypotheses

We investigated the interplay between public service motivation and two factors that have proved to be effective at stimulating job performance in past studies: (1) beneficiary contact (Grant et al. 2007; Grant 2008b) and (2) self-persuasion interventions (Aronson 1999; Heslin, Latham, and Van de Walle 2005; Morwitz and Fitzsimons 2004; Nelson and Norton 2005).

Beneficiary Contact

Experimental studies by Grant and colleagues have demonstrated that meeting the beneficiaries of their efforts can greatly enhance the performance of public sector workers (Grant et al. 2007; Grant 2008b). “Beneficiaries can include individuals and social collectives internal or external to the organization, such as coworkers, supervisors, subordinates, clients, customers, patients, and communities” (Grant 2007, 395). In a randomized, controlled field experiment with employees of a university's call center soliciting alumni donations, callers who had had 10 minutes of face-to-face contact with a scholarship recipient tended to spend more time on the phone (+142 percent) and raise more money (+171 percent) one month later, whereas their colleagues who had had no direct contact with the scholarship recipient or had only read a letter by the recipient without meeting him or her did not improve on these measures (Grant et al. 2007). These results were replicated by a similar quasi experiment in which a group of callers who had met a fellowship recipient for 15 minutes—invited by their manager to describe how their work had made a difference in his or her life—tended to obtain more pledges (+144 percent) and raise more money (+406 percent) one month later compared to before the meeting, whereas no change was reported in these measures among callers in a control group (Grant 2008b). To verify the external validity of these findings, we tested whether the following hypothesis held true in a different experimental setting outside the United States.

Hypothesis 1a: Direct contact with beneficiaries has a positive effect on job performance.

We expected that contact with beneficiaries would be more likely to increase job performance for employees with stronger PSM before treatment than for employees with initially weaker PSM. The rationale for this hypothesis is that employees with higher PSM care more about doing work that has a positive impact on others (Perry and Wise 1990). Being given the opportunity to meet the recipients of their efforts conveys to employees with strong PSM that their jobs provide the potential to express and fulfill their values to the benefit of others. Literature on needs–supplies fit posits that workers are more willing to expend effort to perform effectively when their jobs match their values (e.g., Edwards et al. 2006). As a result, we expected that employees with stronger PSM would be more likely to increase their job performance in response to contact with beneficiaries in order to express and fulfill the value of helping others. In contrast, employees with weak PSM tend to be less concerned about the prosocial impact of their work. Therefore, we expected that contact with beneficiaries would have less relevance to their fulfillment and therefore would be less likely to enhance their performance. To verify whether contact with beneficiaries positively interacted with participants' baseline PSM, we tested the following hypothesis:

Hypothesis 2a: Baseline PSM strengthens the positive effect of contact with beneficiaries on job performance.

The lack of experimental work still leaves unanswered the question of whether PSM is a stable trait or a dynamic state. Should the former be the case, levels of PSM among an organization's employees at any given time would be mainly attributable to attraction–selection–attrition mechanisms. On the other hand, should PSM be a dynamic state, it could be cultivated through organizational processes of socialization and adaptation, similar to other PSM-related values (Cable and Parsons 2001). If this were the case, we would expect that contact with beneficiaries would increase employee PSM by connecting them to the prosocial impact of their jobs. Based on Wright and Grant (2010), we tested whether PSM increased as a result of contact with beneficiaries and whether such increases in the experimental condition—but not the control group—accounted for the effects of the intervention on performance:

Hypothesis 3a: An increase in employee PSM mediates the positive effect of contact with beneficiaries on job performance.

Self-Persuasion Interventions

Social psychological research has demonstrated the motivational effectiveness of interventions that put people in situations in which they are compelled to persuade themselves. Because individuals tend to trust themselves more than they trust other people, changes in beliefs and behavior induced by persuasion from others are often smaller than those stemming from self-persuasion (Aronson 1999). Self-persuasion methods include idea reflection (e.g., Gregory, Cialdini, and Carpenter 1982) and advocacy (e.g., Gordijn, Postmes, and De Vries 2001). To investigate the interplay between PSM and

self-persuasion, Wright and Grant suggested asking public employees to reflect on the importance of their work and then to “publicly advocate, both in writing and in person, why it is critical for each person to engage in public service” (2010, 696). To verify whether findings from previous research into self-persuasion held true in our experimental setting, we tested the following hypothesis:

Hypothesis 1b: Self-persuasion interventions have a positive effect on job performance.

We expected that self-persuasion interventions would be more likely to increase job performance for employees with strong PSM than for employees with weak PSM. The rationale underlying this hypothesis is that individuals with stronger PSM care more about making a difference in other people's lives. Reflecting on the prosocial impact of public service and publicly advocating for it conveys to employees with strong PSM that their jobs provide the opportunity to express and fulfill their values to the benefit of others. As a result, we expected that public employees with stronger PSM would be more likely to increase their efforts in response to self-persuasion interventions compared to their colleagues with weaker PSM. To verify whether self-persuasion interventions positively interacted with participants' baseline PSM in determining job performance, we tested the following hypothesis:

Hypothesis 2b: Baseline PSM strengthens the positive effect of self-persuasion interventions on job performance.

If PSM were a dynamic trait, we would expect self-persuasion interventions to increase public employee PSM by making the prosocial impact of their job more salient for them. As suggested by Wright and Grant (2010), we tested whether PSM increased as a result of self-persuasion interventions and whether these increases in the experimental condition—but not the control group—accounted for the effects of the treatment on performance.

Hypothesis 3b: An increase in employee PSM mediates the positive effect of self-persuasion interventions on job performance.

In the following sections, we present our methods and discuss the results of the experiment that we conducted to test our hypotheses.

Methods

Sample, Design, and Procedures

We conducted a randomized control group experiment on a sample of 90 nurses at a large public hospital in Italy. The hospital employs a staff of more than 1,100 nurses and is part of the Servizio Sanitario Nazionale (Italian National Health Service), the publicly funded Italian national health care system. Of the 90 participants, 65.6 percent were female, the average age was 41.0 years (SD = 11.1), average job tenure was 16.9 years (SD = 10.8), average education was 14.4 years of schooling (SD = 1.5), and average number of dependent children was 1.2 (SD = 0.9). Of the general population of nurses in the hospital, 76.7 percent were women, the average age was 43.7 years (SD = 9.8 years), average job tenure was 18.2 years (SD = 9.3 years),

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average education was 13.9 years of schooling (SD = 1.7), and average number of dependent children was 1.5 (SD = 0.7). The study participants did not differ at the .05 level from the rest of the hospital nurses in terms of gender, age, job tenure, or education. The only statistically significant difference was that those who volunteered for the project had, on average, a lower number of dependent children compared to their colleagues who did not volunteer.

At the beginning of 2011, the hospital administration joined an international cooperation project aimed at strengthening the capacity of the health care system in a former war zone that was facing a humanitarian emergency. The hospital contributed to the project in two ways. First, it offered short-term residency training programs to health care professionals from the project's target area; the project covered travel and accommodation costs for small groups of three to seven practitioners at a time, who were given the chance to go to Italy for a period varying from a few weeks to several months, depending on their specialization. The hospital's second contribution to the project was to provide medical equipment and pharmaceuticals. More specifically, the hospital was in charge of collecting surgical tools and drugs donated by different organizations (e.g., pharmaceutical companies, public and private hospitals, nongovernmental organizations), entering them into an inventory, controlling the quality of the products, and assembling surgical kits ready for shipment to health practitioners operating in the target area. This activity was performed by the hospital's clinical staff on a voluntary basis outside of normal work hours.

The hospital administration allowed us to conduct our experiment in exchange for assistance in recruiting and coordinating nurses willing to volunteer some of their time to prepare surgical kits for shipment. In March 2011, we repeatedly sent out a call for volunteers—both electronically and in paper format—to all of the hospital nurses through the human resources department, which promoted the project to a great extent. The call provided general information about the intentions of the cooperation project along with details of the specific task to be performed and the skills required. The call also stated that participants would be part of an experimental study aimed at finding the best way to carry out the task on a larger scale in the future. In addition to the calls for volunteers sent out through the hospital's human resource department, members of the project team contacted each of approximately 1,100 hospital nurses directly, either in person or by phone. In all, 249 nurses had made themselves available by the end of March 2011. In early April 2011, we randomly selected 90 participants out of these volunteers for our experiment. The volunteers who had not been singled out for the experiment were involved in other phases of the project, carrying out the same task. We randomly assigned the 90 participants to one of three groups—A, B, and C—each consisting of 30 staff members. Group A was the control group. We treated group B with contact with project beneficiaries and group C with self-persuasion interventions. As expected, given the random assignment, the three groups did not differ significantly at the baseline with regard to age, gender, job tenure, years of education, number of dependent children, or baseline levels of public service motivation and conscientiousness.

We summoned each group separately for a kickoff meeting in mid-April 2011. After distributing consent forms and reassuring

participants that their responses would be handled confidentially and would be disclosed only in aggregate form without any identifying information, we surveyed volunteers with regard to their levels of PSM and conscientiousness, in addition to standard demographic information. During the kickoff meetings, we gave participants all of the relevant information about the project's aims and scope and let them practice the task that they would perform. This consisted of retrieving a list of items—including surgical tools and pharmaceuticals—from shelves and boxes, checking shelf-life labels and product integrity, storing the items inside a case according to a specific order, and putting a label on each completed case with a signature and the completion time.

We scheduled three, six-day group shifts: group A, May 2–May 7; group C, May 9–May 14; and group B, May 23–May 28. During their group's six-day shift, volunteers were free to stop by the project room anytime between 10:00 a.m. and 6:00 p.m. One member of the research team was constantly present during that time to supervise activities. The supervisors rotated on a daily basis, following the same order for all of the groups. The nurses were allowed access to the room by swiping their magnetic-strip identification card through an access-control card reader, as required by the hospital's drug storage and control policy. This enabled us to know the number of minutes that each volunteer contributed to the project. Approximately one week after the end of their shift, we surveyed each participant again with regard to PSM, conscientiousness, the intrinsic motivation toward the experimental task and perceived self-efficacy in performing it.

Beneficiary contact (group B). We gave nurses in group B the same information as control group A. Additionally, we exposed participants in group B to direct contact with health practitioners from the beneficiary area who would use the surgical kits assembled by participants and who were spending their short-term residency training period at the hospital. Contact with beneficiaries happened in two ways. First, we invited three beneficiaries to group B's kickoff meeting. They were given a chance to explain the importance and value of the experimental task to the volunteers for about 15 minutes by telling them vivid stories of successful interventions performed thanks to the surgical kits they had received in the past. Second, at least one health practitioner from the beneficiary area was constantly present in the room, welcoming participants at the beginning of their shifts and working on the project without any supervisory responsibility. Because participants had to put a label on each completed case with their signature, we were able to separate out the kits assembled by the practitioners from the beneficiary area, whose work did not count toward group B's performance.

Self-persuasion interventions (group C). Nurses in group C received the same information that we gave control group A. In addition, to induce the process of idea reflection, we asked group C participants to write a few lines—to be included in a presentation that we would deliver to all hospital departments and to all of the other hospitals belonging to the same local health authority—describing how they thought the project would help health care practitioners in the target area improve the lives of their patients. Moreover, we asked each participant in group C to promote the project within their departments and to do their best to recruit at least three volunteers willing to perform the same work in the

future. All of the nurses in group C except one managed to recruit at least one new volunteer. The new volunteers recruited by participants exposed to the self-persuasion condition did not participate in this phase of the project. They were recruited to perform the same work during the subsequent phases in the project, which took place in the following months.

Measures

In this section, we describe the variables and measurements that we used in our experiment.

Performance. We measured four performance-related outcomes: persistence, output, productivity, and vigilance. *Persistence* refers to the amount of time that individuals invest in their efforts (e.g., Dweck and Gilliard 1975; Grant 2007, 2008a, 2008b; Sandelands, Brockner, and Glynn 1988; Weibel, Rost, and Osterloh 2010). We measured persistence as the number of minutes of work that each participant contributed to the project during his or her six-day shift. *Output* refers to the total number of units of work produced by employees as a result of their performance behavior during a certain period of time or in the course of a specific project (e.g., Blumberg and Pringle 1982; Gneezy and Rustichini 2000; Grant 2007, 2008a, 2008b; Schmidt and Hunter 1983). We measured output as the number of surgical kits that each participant assembled during his or her six-day shift. *Productivity* refers to the ratio of output in terms of units of work to input in terms of units of labor (e.g., Adams and Rosenbaum 1962; Griffin, Welsh, and Moorhead 1981). We measured productivity as the average number of surgical kits that each participant completed per minute of work that he or she contributed to the project. *Vigilance* refers to the ability of workers to maintain attention and accuracy while performing their job (e.g., Brewer and Brewer 2011). We measured vigilance as the percentage of surgical kits that each participant assembled correctly.

PSM. We measured PSM with a widely used, five-item version of Perry's (1996) original scale (Alonso and Lewis 2001; Brewer, Selden, and Facer 2000; Christensen and Wright 2011; Kim 2005; Pandey, Wright, and Moynihan 2008; Wright and Pandey 2008). We measured PSM levels as reported by participants at the beginning of the kickoff meetings and about one week after they had completed their shift. We asked participants to indicate their agreement with the following statements: "Meaningful public service is very important to me," "I am often reminded by daily events about how dependent we are on one another," "Making a difference in society means more to me than personal achievements," "I am prepared to make enormous sacrifices for the good of society," and "I am not afraid to go to bat for the rights of others even if it means I will be ridiculed." All items used seven-point Likert-type scales with anchors of 0 (disagree strongly) to 6 (agree strongly). Cronbach's alpha was .81 at baseline and .85 at follow-up.

Conscientiousness. In addition to reverse causality, omitted variable bias is the most concerning threat to the internal validity of existing literature investigating the effects of PSM on job performance. As pointed out earlier, most studies rely on observational designs, which are not able to rule out the possibility that some variables affecting both job performance and PSM are left out of the analysis. In particular, Wright and Grant (2010) suggest that

conscientiousness, one of the five factors of personality (Goldberg 1990), may act as a lurking variable, causing a spurious correlation between PSM and job performance. On the one hand, conscientious employees tend to show higher levels of motivation, duty, and other-centered orientation (Judge and Ilies 2002; Moon 2001). On the other hand, conscientious individuals are more likely to set themselves higher goals and achieve highly (Barrick, Mount, and Strauss 1993; DeNeve and Cooper 1998; McGregor and Little 1998). To address the concern that conscientiousness might act as a confounding variable, we controlled for conscientiousness, both at baseline and follow-up, with four items developed by Donnellan et al. (2006): "I get chores done right away," "I often forget to put things back in their proper place" (reverse coded), "I like order," and "I make a mess of things" (reverse coded). Cronbach's alpha was .93 at baseline and .89 at follow-up.

Intrinsic motivation. We controlled intrinsic motivation in performing the experimental task reported by participants by means of items adapted from Grant (2008a). Respondents were asked to indicate their agreement with the following statements: "I felt motivated to perform the job because I enjoyed the task itself," "The task was fun," "I found the task engaging," and "I enjoyed the task." All items used seven-point Likert-type scales with anchors of 0 (disagree strongly) to 6 (agree strongly). Cronbach's alpha was .91.

Self-efficacy. Several studies have shown that performing well is likely to strengthen self-efficacy (e.g., Bandura, 2006; Gist and Mitchell 1992; Stajkovic and Luthans 1998), which is an individual's belief "in their capabilities to produce given attainments" (Bandura 2006, 307). Self-efficacy, in turn, has proved to be a powerful motivator (Bandura 1994; Davidson and Eden 2000; Wright 2004, 2007) that is capable of increasing "effort, persistence, strategizing" (Heslin and Klehe 2006, 705), which are predictors of high performance (Bandura 1997; Stajkovic and Luthans 1998). Drawing on Bandura (2006), we developed a four-item scale to measure participant perception with regard to self-efficacy in performing the experimental task. We asked respondents at follow-up to indicate their agreement with the following four statements: "I felt competent performing the task," "The task came easy to me," "I was able to perform the task effectively," and "I felt up to the task." All items used seven-point Likert-type scales with anchors of 0 (disagree strongly) to 6 (agree strongly). Cronbach's alpha was .76.

Demographic controls. From a demographic standpoint, we controlled for age, gender, job tenure, years of education, and number of dependent children. We included this last control to take into account that participants with children may have had less time to contribute to the project outside working hours.

Reliability estimates (Cronbach's alpha) for the scales that we used in our experiment ranged from .76 and .93, which provides evidence of convergent validity. A confirmatory factor analysis indicated that the individual scale items converged on their respective latent variables (lambda values ranged from .63 to .91). In support of the discriminant validity of the measures used, the average proportion of shared variance between any two measures was low ($r^2 = .10$), and no measure shared more than 34 percent variance with any other measure. Inferential χ^2 statistics and descriptive

Table 1a Performance Outcomes by Condition

Condition	Control		Contact with Beneficiaries		Self-Persuasion	
	Mean	SD	Mean	SD	Mean	SD
Min.	145.96	56.71	238.73	159.79	215.40	117.08
Pcs.	123.40	65.80	254.83	240.62	227.57	187.37
Pcs./Min.	.80	.15	.92	.25	.93	.27
% Errors	8.70	3.12	5.80	3.73	6.03	3.73
N	30		30		30	

Min. = minutes of work; Pcs. = surgical kits assembled; Pcs./Min. = pieces completed per minute; % Errors = percentage of surgical kits assembled incorrectly.

Table 1b Differences in Group Means of Performance Variables Compared to Control Group

Condition	Contact with Beneficiaries	Self-Persuasion
Variable		
Min.	+ 92.77**	+69.43*
Pcs.	+131.43**	+104.17*
Pcs./Min.	+.12*	+.12*
% Errors	-2.90*	-2.67*

* $p < .05$; ** $p < .01$; *** $p < .001$.

goodness-of-fit indices suggested that all of the scales that we used in the study were a reasonable fit to our data: $\chi^2(113) = 128.13$, $p > .05$; root mean square error of approximation (RMSEA) = .06; comparative fit index (CFI) = .95; Tucker-Lewis index (TLI) = .94.

Results and Discussion

Table 1a displays means and standard deviations for the four performance outcomes—persistence, output, productivity, and vigilance—by condition. A multivariate analysis of variance (MANOVA) provided strong evidence that performance differed

Table 2a Regression Analyses Predicting Performance Measures: Robust Standard Error and Mean-Centered PSM

	Minutes	Pcs.	Pcs./Min.	% Errors
Independent variables				
Contact with beneficiaries	93.36 **	132.12**	.12**	-2.92**
Self-persuasion	71.37**	106.92*	.13**	-2.72**
PSM	89.61**	103.50*	.21**	-2.79*
Contact with beneficiaries \times PSM	165.33**	268.00**	.20*	-3.00*
Self-persuasion \times PSM	110.60**	206.20**	.26*	-3.13*
Constant	145.37**	122.71*	.30**	8.72**
R^2	0.79	0.74	0.76	0.63

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2b Predicted Changes in Performance Measures for One Scale-Point Change in PSM: Robust Standard Error and Mean-Centered PSM

Condition	Control	Contact with Beneficiaries	Self-Persuasion
Δ Min./ Δ PSM	89.61***	254.94***	200.21***
Δ Pcs./ Δ PSM	103.50***	371.50***	309.70***
Δ (Pcs./Min.)/ Δ PSM	.21***	.40***	.47***
Δ %Errors/ Δ PSM	-2.79*	-5.80***	-5.92***

* $p < .05$; ** $p < .01$; *** $p < .001$.

significantly across the three groups. All of the usual MANOVA test statistics were significant at the .05 level: Wilks's lambda ($W = .82$, $F(8,168) = 2.20$, $p < .05$), Pillai's trace ($P = 0.18$, $F(8, 170) = 2.15$, $p < .05$), Lawley-Hotelling's trace ($L = .22$, $F(8, 166) = 2.24$, $p < .05$), and Roy's largest root ($R = 0.19$, $F(4, 85) = 4.11$, $p < .05$).

Table 1b shows the differences in the means of the four performance metrics for group B and group C with respect to control group A. Both group B (contact with beneficiaries) and group C (self-persuasion)

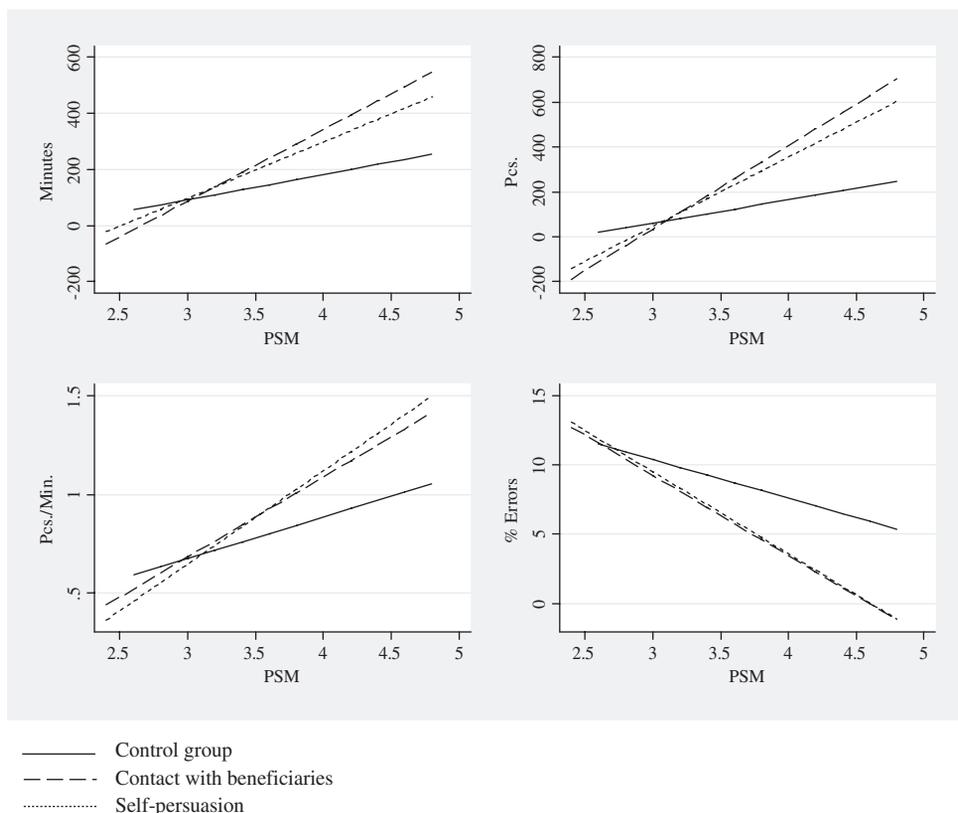


Figure 1 Regression Slopes for the Four Performance Outcomes

significantly outperformed group A (control) in each of the four performance areas. These results provide support to hypotheses 1a and 1b.

Table 2a shows that the positive effects that both experimental conditions had on job performance were stronger among employees reporting higher PSM before treatment. For each of the four performance outcomes, the interaction between initial PSM and both contact with beneficiaries and self-persuasion was significant and had the sign that we expected. In other words, contact with beneficiaries and self-persuasion interventions turned out to be more effective at improving the persistence, output, productivity, and vigilance of individuals who entered the experiment with stronger PSM. These results support hypotheses 2a and 2b.

Table 2b reports the predicted changes in the four performance outcomes for a one scale-point change in PSM, separately for each group. Figure 1 provides visual representations of the same data. For all of the four performance measures, regression lines are steeper in the case of the two experimental conditions relative to the control group. This confirms that both contact with beneficiaries and self-persuasion interventions were more effective at increasing persistence, output, productivity and reducing the error rate (that is, increasing the vigilance) of participants with stronger initial PSM.

We started investigating hypotheses 3a and 3b by running a series of paired *t*-tests for variations in PSM levels between baseline and follow-up surveys. Exposure to both contact with beneficiaries and self-persuasion interventions turned out to be significantly associated with PSM increases, on the order of one-third of a standard deviation. No significant changes showed up in the control group (table 3a).

We investigated whether the increase in participant PSM partially mediated the positive effects of contact with beneficiaries and self-persuasion interventions on job performance. For each of the two experimental conditions, the increase in PSM may be considered a mediator if (1) the treatment determines an increase in PSM, (2) the treatment significantly affects job performance without controlling for any increase in PSM, (3) the increase in PSM has a significant unique effect on job performance, and (4) the effect of the treatment on job performance becomes insignificant when

the change in PSM is added to the model (MacKinnon and Dwyer 1993; MacKinnon, Warsi, and Dwyer 1995; Preacher and Hayes 2004). If all four of these conditions are met, then the data are consistent with the hypothesis that an increase in PSM completely mediates the effect of the experimental treatment on job performance. Partial mediation is indicated if the first three conditions are met and the effect of the treatment on job performance shrinks—but remains statistically significant—when we add the change in PSM to the model. For both our experimental conditions, a series of Sobel-Goodman tests showed that both the direct effects on the four performance outcomes and the indirect effects—mediated by increases in PSM—were significant at the .05 level. Table 3b reports the percentages of the effects on performance outcomes that were mediated by increases in PSM.

Drawing on MacKinnon et al. (2002), we conducted supplementary analyses to determine whether the partial mediating effect of change in PSM remained after controlling for the moderating effect of baseline PSM. We fitted eight pairs of regression models, that is, four pairs—one per performance measure—for each experimental condition. Each pair consisted of two regression models: model A and model B. In models A, we regressed each of the four performance measures on three variables: (1) a dummy equal to 1 for nurses in the treatment group and 0 for individuals in the control group, (2) baseline PSM, and (3) the interaction between baseline PSM and the treatment dummy. In models B, we added (4) the change in PSM between baseline and follow-up. As expected, all of the coefficients in models A and models B were significant at the .05 level. For all of the eight pairs of regressions, the comparison between models A and models B showed that the association between the treatment variable and the performance measure decreased, although it remained statistically significant, after including the change in PSM. A series of Sobel tests using the critical values recommended by MacKinnon et al. (2002) showed that the decrease was statistically significant at the .05 level in all eight pairs of regressions. We reached similar conclusions controlling for demographic characteristics, conscientiousness, as well as for self-efficacy and intrinsic motivation in performing the experimental task. These results suggest partial mediation, thus providing partial support for hypotheses 3a and 3b.

Limitations

The results of our research should be interpreted in light of several limitations. As far as construct validity is concerned, a first potential threat stems from the way in which we experimentally manipulated contact with beneficiaries. In previous experimental work, the employees of a university call center soliciting alumni donations met a scholarship recipient (Grant et al. 2007; Grant 2008b). Nurses in our experiment were exposed to personal contact with health practitioners from a former war zone facing a humanitarian emergency who would use the surgical kits assembled by participants. As in previous research by Grant and colleagues, the participants met the direct recipients of their efforts—in our case, the health practitioners. However, we might expect that personally introducing the nurses to patients who had benefited from those surgical kits in the past would have been more effective at emphasizing the public service emphasis of the experimental task. Unfortunately, bringing one of the patients to Italy was not feasible for legal and practical reasons. A second aspect in which our study differed from previous

Table 3a Changes in PSM by Condition

Condition	Control		Contact with Beneficiaries		Self-Persuasion	
	Mean	SD	Mean	SD	Mean	SD
PSM (baseline)	3.61	.53	3.58	.54	3.59	.52
PSM (follow-up)	3.63	.67	3.76	.83	3.74	.78
Δ PSM	0.02	.22	0.17*	.38	0.16*	.40

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3b Total Effect on Performance Metrics Mediated by Changes in PSM by Condition

Condition	Contact with Beneficiaries	Self-Persuasion
Performance Outcomes		
Min.	39%*	33%*
Pcs.	41%*	34%*
Pcs./Min.	54%*	44%*
Errors/100 Pcs.	27%*	22%*

* $p < .05$; ** $p < .01$; *** $p < .001$.

research by Grant and colleagues lies in the treatment level: in addition to an initial short meeting, participants in our experiment were exposed to the presence of one beneficiary while performing their task. Moreover, the fact that nurses were not only introduced to the direct recipients of their effort but also worked with them may have left some room for confusion with other variables. As suggested by an anonymous reviewer, role modeling or social desirability concerns might have induced participants to exert more effort, thus creating the risk of overestimating the effect of the contact with beneficiaries treatment. These differences from previous experiments with beneficiary contact must be taken into account when interpreting the results of our study and should certainly be investigated further in future research into this subject.

A potential threat to the external validity of the results of our experiment stems from the fact that participants were randomly selected among 249 hospital staff who had volunteered and not from the entire population of more than 1,100 nurses. Some pieces of circumstantial evidence may partially reduce concerns about the generalizability of our findings to the hospital nurses who did not volunteer. First, the study sample turned out to be reasonably similar to the general population of nurses in the hospital in terms of demographic characteristics. As we explained earlier, the study participants did not differ at the .05 level from their colleagues in terms of gender, age, job tenure, or years of education. The only significant difference emerged with regard to the average number of dependent children, which was lower for those who volunteered for the project compared to the rest of their colleagues. Second, volunteering seems to be quite common among hospital staff. Survey data provided to us by the human resources department of the hospital show that about 58 percent of the administrative staff and 81 percent of the clinical and medical staff participated in some kind of volunteer project within the hospital (e.g., blood donations, donation collections) in 2010, the last year for which data were available. Although these two pieces of circumstantial evidence may help the reader assess the generalizability of the study results to other settings, external validity is not a strength of our research design, which was aimed at maximizing internal validity. On this point, we cannot but agree with Wright and Grant, who observe that “the choice of research design reflects inherent trade-offs between the ability to make causal statements, the ability to generalize those statements to other settings, and the ability of a broader audience to accept and apply them. While each attribute is desirable, at best, any single research design can only maximize two of these criteria while falling short on the third” (2010, 692).

Another potential shortcoming of our research is attributable to the fact that we did not use a number of phases of observation before and after the introduction of treatments. Without an interrupted time series design, it is hard to tell how durable the changes detected in PSM between baseline and follow-up will be.

Conclusion

Despite the methodological limitations illustrated in the previous section, this article offers three distinctive contributions to research on the relationship between motivation and job performance in public organizations. The first contribution is to replicate the results of previous experimental research in a different setting, showing the effectiveness of contact with beneficiaries (Grant et al.

2007; Grant 2008b) and self-persuasion interventions (Aronson 1999; Heslin, Latham, and Van de Walle 2005; Morwitz and Fitzsimons 2004; Nelson and Norton 2005) at improving the performance of public employees. We experimentally found that meeting the beneficiaries of their efforts greatly enhanced the persistence, output, productivity, and vigilance of a group of Italian nurses. We obtained similar results when we asked another group of nurses to reflect on the social impact of their work and then publicly advocate for it, both in writing and in person. Our findings corroborated the external validity of previous research by replicating the results of experimental work that was primarily conducted in the United States and Canada with different experimental manipulations, a different type of worker, and outside the North American context.

The second contribution of this article is to take a small step toward resolving the controversy over whether PSM is a stable trait or a dynamic state (Brewer 2003; Crewson 1997; Houston 2006; Karl and Peat 2004; Posner and Schmidt 1996; Rainey 1982). Our experimental findings show that PSM is a dynamic state, or at least a trait showing significant within-person variability. In our experiment, nurses exposed to either contact with program beneficiaries or self-persuasion interventions showed statistically significant increases in their levels of PSM compared to a control group. This suggests that levels of PSM among an organization’s employees at any given time are not only attributable to attraction-selection-attrition mechanisms, but also—like other PSM-related values (Cable and Parsons 2001)—may be influenced through organizational processes.

The third, and perhaps most relevant, contribution of our work is to add much-needed experimental evidence to the question of whether and how PSM fosters better job performance. In this regard, our data show that both contact with program beneficiaries and self-persuasion interventions induced larger increases in performance among employees self-reporting stronger PSM before being exposed to these two experimental conditions. Moreover, the significant increases in PSM that we observed in the experimental conditions—and not in the control group—partially mediated the positive effect on performance stemming from contact with beneficiaries and self-persuasion interventions. These results significantly advance our knowledge about the causality of the relationship between PSM and job performance among public employees.

Our research also provides relevant and practical implications for public organizations and their managers. First, we have added valuable evidence to the existing literature as to the effectiveness of beneficiary contact and self-persuasion interventions for enhancing the performance of public workers. The fact that we replicated the results of previous studies with a different typology of workers and using different experimental manipulations provides compelling evidence of the effectiveness of these two conditions. Moreover, our study may be particularly valuable internationally because it is the first of its kind, to our knowledge, to be conducted outside the North American context. Based on our results, it seems imperative that public managers come up with creative ways to introduce self-persuasion interventions and to put employees in direct contact with the beneficiaries of their efforts whenever possible. The fact that solutions can be implemented at

a very limited cost, like those we experimented with in our study, makes them particularly useful for public organizations facing unprecedented budget cuts.

A more general implication of our study is that organizational interventions do in fact affect employee PSM. Based on our results, it appears that the levels of PSM found among an organization's employees may be not wholly determined by attraction-selection-attrition mechanisms but may also be influenced by the organization to some extent. In light of the beneficial effects of PSM on job performance, public managers should pay particular attention to implementing PSM-enhancing interventions, while avoiding practices that may depress employee PSM. These results call for further research—true field experimental work in particular—into the impact that management tools, such as performance-related pay provisions (e.g., Bellé 2010; Perry, Engbers, and Jun 2009) have on PSM among public employees.

Note

1. We conducted confirmatory factor analysis using LISREL 8.80. Because of the ordinal nature of the data at the item level, we used weighted least squares estimation. A lower maximum likelihood χ^2 indicates a better fit. Because χ^2 can be highly problematic, as it is based on very stringent hypotheses (Brown 2006; Jöreskog 1969), Hu and Bentler (1999) recommend also looking at RMSEA, CFI, and TLI. RMSEA values close to .08 or below and CFI and TLI values close to .90 or above suggest a reasonably good fit (Byrne 2001; Kline 2005; Vandenberg and Lance 2000).

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It appears that the levels of PSM found among an organization's employees may be not wholly determined by attraction-selection-attrition mechanisms but may also be influenced by the organization to some extent.

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