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To cite this article: Jinhai Yu (2021): Agency autonomy, public service motivation, and organizational performance, Public Management Review, DOI: [10.1080/14719037.2021.1980290](https://doi.org/10.1080/14719037.2021.1980290)

To link to this article: <https://doi.org/10.1080/14719037.2021.1980290>



Published online: 14 Sep 2021.



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ABSTRACT

While agency theory predicts mixed impacts of agency autonomy on organizational performance conditioned by result-based controls, stewardship theory predicts positive effects. This study contrasts the two views by introducing public service motivation (PSM) to this debate. As the PSM increases, the employees move closer to the ideal type of stewards, and thus agency autonomy should have a larger impact on organizational performance. Using the 2005 and 2010 Merit Principles Surveys, the empirical tests support this proposition. This study bridges the literature on agency autonomy and PSM by highlighting interactions between organizational structures and employee motivations in shaping organizational performance.

KEYWORDS Agency autonomy; public service motivation; organizational performance; agency theory; stewardship theory

Agency autonomy and organizational performance have been central issues in the public administration literature. In democratic governments, the delegation of power by politicians to public administrators is commonplace, if not inevitable (Bendor, Glazer, and Hammond 2001). While the bureaucratic politics literature focuses on institutional designs that allow varying agency autonomy as a tool of political control (e.g. Kim, 2008; Enns-Jedenastik, 2016; Palus and Yackee 2016; Hammond et al. 2019), it remains a critical issue to examine their performance impact. For public administration scholars, understanding the performance impact of agency autonomy is key to evaluating the merits of various administrative reforms that advocate for higher managerial autonomy, for example, the New Public Management reforms (Bezes and Jeannot 2018).

However, there has been no consensus on the theoretical explanations of or empirical evidence on the impact of agency autonomy on organizational performance. The two main theories, including agency theory and stewardship theory, make different assumptions and prescribe different policy solutions. Agency theory assumes information asymmetry and goal conflicts in the principal-agent relationship between political principals and administrative agencies (Eisenhardt 1989). Agency theory, by depicting public administrators as ‘agents’, predicts that result-based control is necessary while increasing agency autonomy. In contrast, stewardship theory assumes that

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public administrators are ‘stewards’, who are pro-organizational and trustworthy, and thus maintain goal alignments with the political principals (Davis, David Schoorman, and Donaldson 1997). Consequently, result-based control is not needed for agency autonomy to increase organizational performance. Empirically, studies have reported mixed effects of agency autonomy on organizational performance (Yamamoto 2006; Bjurström 2021), calling for a better understanding of the conditions under which agency autonomy may matter.

We argue that public service motivation (PSM) constitutes a critical condition determining whether agency theory or stewardship theory is more likely to hold. At one extreme, if all employees in one agency have a high level of PSM, the goal conflicts between principals and agents should be low. To the degree that they all highly value public services, PSM should provide a common ground for building consensus on policy-specific ends and means. As predicted by stewardship theory, agency autonomy should be more likely to increase organizational performance. At the other extreme, if the employees have low PSM, the goal conflicts may be high, resulting in a case of agency theory. Agency autonomy may provide opportunities for shirking, leading to potentially lower organizational performance.

To empirically test this proposition, we focus on U.S. federal agencies using two waves of Merit Principles Survey (MPS) data in 2005 and 2010. We choose the two sample periods because they allow simultaneous measurements of agency autonomy, PSM, and organizational performance, when combined with data from other sources.¹ Using multiple samples helps demonstrate the robustness of the empirical findings. We find consistent results for the two samples in 2005 and 2010, suggesting that the findings may have continued policy relevance over time.

The present study makes three contributions to the literature. First, through introducing PSM, we contrast the theoretical explanations for the performance impact of agency autonomy by agency theory and stewardship theory. Second, we show that PSM is a critical condition for agency autonomy to improve organizational performance. Third, the results show that agency autonomy is an important condition for the PSM-performance link to materialize for the PSM literature. Overall, the study helps explain the lack of consistent empirical evidence on the impact of agency autonomy and PSM on organizational performance by highlighting the interdependence of the two factors.

Previous studies

Autonomy and agency performance

Empirical studies on the impact of agency autonomy on organizational performance have led to mixed findings. On the one hand, many studies have found positive effects of agency autonomy on performance measured on multiple dimensions. They include the organizational culture of innovation (Wynen et al., 2014), goal attainment in contracting (Bjornholt and Salomonsen, 2015), citizen participation in the budgeting process (Neshkova 2014), use of performance-based management (Wynen and Verhoest 2016), and the range of policy options (Anderson and Potoski, 2016). Previous studies have found positive effects in various organizational settings, including tax administration agencies (Taliercio, 2004), Japanese semi-autonomous public agencies (Yamamoto 2006), and water utilities (Braadbaart, Niels, and Hoffer 2007).

On the other hand, some studies find negative or no effects of agency autonomy on organizational performance. For example, Kim and Cho (2014) find negative effects of human resource autonomy and financial autonomy on performance. Bjurström (2021) finds that high agency autonomy is associated with lower levels of inter-agency coordination. Noticeably, Verzulli, Jacobs, and Goddard (2018) find little impact of autonomy of English NHS hospitals on performance. Also, scholars have examined various conditions under which autonomy may influence performance. Cordery et al. (2010) find a positive relationship between team autonomy and team performance conditioned by task uncertainty. Honig (2019) shows that the impact of agency autonomy on performance is moderated by environmental unpredictability.

While agency theory is the primary theoretical perspective on the impact of agency autonomy on organizational performance, scholars have applied stewardship theory to examine agency autonomy in the context of the relationships between central governments and administrative agencies (Schillemans 2013). Schillemans and Bjurström (2020) combine agency and stewardship theories to explain employee satisfaction with the governance of relationships between a central government and autonomous agencies. They find that a combination of governance arrangements from both theories is most satisfactory.

Overall, while existing studies have resorted to agency theory or stewardship theory in explaining the performance impact of agency autonomy, it remains unclear which theory works better. We make such comparisons by introducing the growing PSM literature to the study of agency autonomy. We add to the literature on the conditional effects of agency autonomy on organizational performance by focusing on PSM as a critical condition.

PSM and agency performance

PSM is one of the most vibrant research topics in public administration (e.g. Perry, Hondeghem, and Wise 2010; Bellé ; Perry and Vandenabeele 2015; Papenfuß and Keppeler 2020; Crucke et al. 2021; Ki 2021). According to Rainey and Steinbauer (1999, 20), PSM is a ‘general, altruistic motivation to serve the interests of a community of people, a state, a nation or humankind’. PSM has multiple dimensions, including attraction to policymaking, commitment to the public interest, compassion, and self-sacrifice (e.g. Perry 1996; Kim 2009).

Scholars have long studied the impact of PSM on performance. Many existing studies focus on the impact of PSM on individual job performance and find mixed effects (Brewer 2008; Miao et al. 2019). In contrast, there are relatively fewer studies of PSM on organizational performance. For example, Ritz, Brewer, and Neumann (2016) report that only 8 of 239 studies use organizational performance as the outcome of PSM. To operationalize organizational-level PSM, scholars have used the average PSM of employees within an agency (Petrovsky and Ritz 2014; Van Loon 2016; Van Loon et al. 2018).

In general, studies have led to inconclusive findings on the impact of PSM on organizational performance (Rainey and Steinbauer 1999; Brewer and Selden 2000; Kim 2004; Park and Rainey 2008; Ritz 2009; Petrovsky and Ritz 2014). While some studies report positive effects (Rainey and Steinbauer 1999; Brewer and Selden 2000), others find no effects of PSM on organizational performance. For instance, Petrovsky

and Ritz (2014) find that PSM, particularly the attraction to policymaking dimension, is not associated with organizational performance in aggregated data analysis once correcting for common source bias.

Given the lack of consistent findings on the impact of PSM on organizational performance, it seems possible that the impact of PSM is conditional. Few studies have explored the conditions under which PSM shapes organizational performance. One exception is Van Loon et al. (2018). They find positive effects of PSM on perceived performance at both the individual and the organizational level only when the societal impact potential is high. While we primarily examine how PSM moderates the impact of agency autonomy on organizational performance, the analysis also sheds light on how agency autonomy serves as a condition for the PSM-performance link to work.

PSM and the autonomy-performance link

Agency theory and stewardship theory

Agency theory, or the principal-agent model, is a predominant perspective to explain why and when agency autonomy affects organizational performance. Jensen and Meckling (1976, 308) define ‘an agency relationship as a contract under which one or more persons (the principal(s) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent’. In a typical setup, elected officials are the political principals, while administrative agencies constitute the agents. There are usually information asymmetry and goal conflicts between the principals and the agents. The principals must delegate tasks to the agents due to a lack of expertise or knowledge (Lupia and McCubbins 1994). For the same reason, the agents hold more information about completing the tasks assigned by the principals. As Eisenhardt (1989, 58) put it, the agency problem arises ‘when (a) the desires or goals of the principal and agent conflict and (b) it is difficult or expensive for the principal to verify what the agent is actually doing’.

Under agency theory, agency autonomy may increase organizational performance. First, autonomy allows the agents to make full use of their expertise. For example, Cordery et al. (2010) argue that autonomy allows team members to use requisite knowledge and skills to make decisions that can improve team performance. Second, autonomy provides a commitment device to indicate the credibility of the promise that the principals would not interfere. Formal agency independence, which allows higher autonomy, is a commitment device to indicate neutral competence (Taliercio, 2004). This idea is commonly reflected in the institutional designs of tax administration agencies, anti-corruption agencies, regulatory agencies, or central banks. For instance, Taliercio (2004) finds that the autonomy of tax administration agencies increases their performance. Third, managerialism suggests that the agents may be motivated by professionalism, which is more likely to occur in the presence of higher agency autonomy. Managerialism holds that the public sector can be managed as well as the private sector. Thus, public managers should be given higher autonomy to act like their counterparts in the private sector. The slogan is ‘let managers manage’, as reflected in the New Public Management reforms (Bezes and Jeannot 2018).

However, due to agency problems, increasing autonomy has its own costs. Agency autonomy creates a moral hazard problem in that the agents may deviate from the principals by using the information asymmetry to pursue their own goals.

When goal conflicts arise, the principals must add some control systems to ensure that the agents use the increased autonomy to pursue the assigned tasks diligently. Therefore, increased autonomy is often accompanied by strengthened control mechanisms, such as result control, performance-based evaluation, or an increase of competition (Verhoest 2005; Anand et al. 2012). This results in the so-called ‘paradox of autonomy’ in that increased autonomy is coupled with increased control.

Proponents of agency theory assume goal conflicts between the principals and the agents while prescribing institutional solutions to ‘correct’ the agents’ incentives so that they do not shirk. The various forms of result-based control are examples of such institutional correctives. If the institutional arrangements are in place to reduce agents’ shirking, agency autonomy should increase organizational performance. Otherwise, agency autonomy can have a minimal or negative impact to the extent that it increases shirking and decreases organizational performance. Overall, agency theory predicts a positive effect of agency autonomy on organizational performance that is conditional on the presence of result-based control mechanisms.

Others question the assumption of goal conflicts by arguing that goal conflicts are not invariant; instead, in some cases, goal alignments may be the norm (Waterman and Meier 1998). If so, the institutional remedies to prevent agents from shirking would no longer be necessary, and agency autonomy would increase performance unconditionally. This line of reasoning is represented by stewardship theory. Public administration scholars have widely used stewardship theory to explain relationships between city officials and librarians (Bundt 2000), social service contracting relationships (Dicke 2002; Dicke and Steven Ott 2002), government-non-profit social service contracting relationships (Van Slyke, 2007), contracted providers’ motivations to use service monitoring tools (Lambright 2009), and relationships between central governments and administrative agencies (Schillemans 2013; Schillemans and Bjurström 2020).

Stewardship theory provides an alternative perspective on the accountability mechanisms in principal-agent relationships. Hernandez (2012, 174) defines ‘stewardship as the extent to which an individual willingly subjugates his or her personal interests to act in protection of others’ long-term welfare’. While agency theory depicts agency employees as individualistic, opportunistic, and self-serving, stewardship theory depicts them as collectivists, pro-organizational, and trustworthy (Davis, David Schoorman, and Donaldson 1997). Specifically, ‘stewardship theory defines the situations in which managers are not motivated by individual goals, but rather are stewards whose motives are aligned with the objectives of their principals’ (Davis, David Schoorman, and Donaldson 1997, 21). Unlike agents who maximize individual utility independent of organizational goals, stewards maximize organizational goal achievements to maximize their own utility. Agents focus on extrinsic motivation; stewards focus on intrinsic rewards, pursuing ‘opportunities for growth, achievement, affiliation, and self-actualization’ (Davis, David Schoorman, and Donaldson 1997, 28).

According to stewardship theory, principals should empower stewards by increasing autonomy. As Davis, David Schoorman, and Donaldson (1997, 25) put it, ‘a steward’s autonomy should be deliberately extended to maximize the benefits of a steward, because he or she can be trusted’. In other words, stewards share the policy goals of principals. Control mechanisms are unnecessary and can be

counterproductive by crowding out intrinsic motivations of stewards (e.g. Frey, Homberg, and Osterloh, 2013). Therefore, stewardship theory predicts a positive, unconditional impact of agency autonomy on performance.

PSM and the agent-steward continuum

Given the differences between agency theory and stewardship theory and the differing predictions on the performance impact of agency autonomy, a critical question to be answered is *when* either or both theories hold. While previous studies disagree on whether agency theory and stewardship theory are substitutes (Bundt 2000) or complements (Davis, Schoorman, and Donaldson, 1997), more recent studies find complementary relationships (Van Slyke, 2007; Lambright 2009). Lambright (2009) argues that agency theory and stewardship theory should be viewed on an agent-steward continuum.

Even if agents and stewards coexist, what makes agency employees more likely to act as agents or stewards? Davis, David Schoorman, and Donaldson (1997) propose that employees are more likely to become stewards when motivated by higher-order needs, intrinsic factors or have strong identification and value commitments with their organizations. Hernandez (2012) argues that stewardship behaviours are created by developing other-regarding perspectives, generating long-term orientations, and building affective commitments.

We argue that one intrinsic motivation conducive to stewardship is PSM. Among the four dimensions of PSM, attraction to policymaking and commitment to the public interest echo the assumption of stewards who have value commitments with organizations and pursue higher-order needs. The compassion and self-sacrifice dimensions resemble the affective commitments and other-regarding perspectives of stewardship as identified by Hernandez (2012). As Schott et al. (2019) argue, PSM is associated with societal altruism behaviour, which should contribute to stewardship. Empirically, Battaglio and Gelgec (2017) find that stewardship is positively associated with PSM in the Turkish public sector.

Thus, high PSM provides one condition under which stewardship theory is more likely to apply. A high level of PSM makes it more likely that political principals and administrative agents share the same goals of making good public policy. On the part of agents, at a minimum, high PSM indicates a strong commitment to making and implementing 'good public policy'. On the part of principals, it seems plausible to assume that political principals, or elected officials, pursue good public policies in addition to such individual incentives as winning re-election (e.g. Carpenter 2001; Gailmard and Patty 2007). It could be that political principals have genuine interests in 'good public policy'. Alternatively, political principals may treat good policy performance as an instrument to maximize the odds of winning re-election. As a result, political principals should be willing to increase autonomy to 'reward' the administrative agents with high PSM who make good use of their own expertise to perform well.

More broadly, studies have shown that common interests in public policy contribute to goal alignments, increased autonomy, and improved performance. Policy-minded agency employees may seek to use expertise to make good policies that political principals themselves care about. Carpenter (2001) argues that agency autonomy is based on reputation, networks, and policy innovation. He proposes that

agencies attain autonomy by showing good policy performance that political principals highly value. Similarly, Gailmard and Patty (2007) assume that some public employees are policy-motivated and prefer to invest in expertise, which leads politicians to delegate more policy discretion, resulting in greater agency autonomy.

On the other end, low PSM provides a scenario where agency theory is more likely to hold. Many scholars argue that agency theory is less applicable to the public sector than the private sector because PSM plays a unique role for public employees (Perry and Wise 1990; Larkin, Pierce, and Gino 2012; Frey, Homberg, and Osterloh, 2013). Some further propose PSM as a substitute for such control systems as pay for performance based on agency theory (Moynihan and Pandey 2010; Langbein 2010; Frey, Homberg, and Osterloh, 2013). If low PSM is coupled with severe agency problems, employees with lower PSM are more likely to behave like agents within an agency.

Conversely, high PSM can reduce agency problems. For example, Gailmard (2010) argues that PSM at an organizational level can mitigate principal-agent problems. Specifically, ‘PSM alleviates the moral hazard problem by bringing in individuals who want to work on the mission of a public organization and are self-sacrificing or altruistic’ (Gailmard 2010, 40). If so, a higher level of PSM makes agency theory less relevant and stewardship theory more so. Moynihan and Pandey (2010) argues that PSM can mediate the moral hazard problems in principal-agent relationships. As Moynihan and Pandey (2010, 26) puts it,

Intrinsic belief in the value of public sector work may minimize self-interested behaviour. Extrinsically oriented individuals are more likely to be self-interested and concerned with individual outcomes. For this reason, they are more likely to resort to moral hazard if there is an incentive to exploit incomplete contracts. PSM is a construct that taps into this intrinsic motivation in a public sector setting.

To summarize, PSM constitutes a critical condition to separate when agency theory or stewardship theory better explains the impact of agency autonomy on performance. When the PSM is high, the agency employees are more likely to act like ‘stewards’ and share policy goals with political principals. Granting these agency employees, or ‘stewards’, a greater level of autonomy should lead unambiguously to better

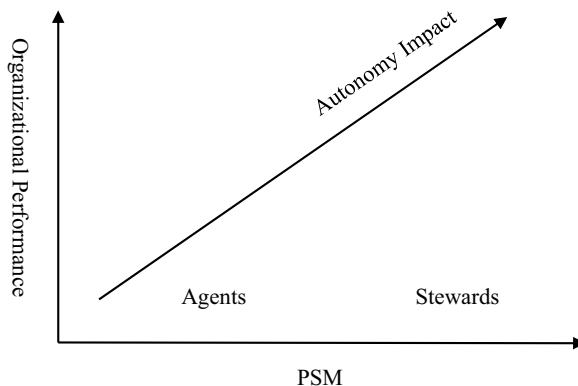


Figure 1. PSM, autonomy, and organizational performance: a conceptual map.

organizational performance. In contrast, when the PSM is low, the agency employees are more likely to behave like ‘agents’ and have goal conflicts with political principals. As a result, depending on whether some result-based control is in place, increased agency autonomy may or may not lead to improved organizational performance. [Figure 1](#) shows the conceptual relationships among PSM, agency autonomy, and organizational performance. As the average level of PSM increases, agencies move from ‘agents’ to ‘stewards’, leading the impact of agency autonomy on organizational performance to increase. Therefore, we test the following hypothesis.

Hypothesis 1: *Agency autonomy has a larger, positive impact on organizational performance as the PSM increases.*

Data and measurement

Measuring PSM

The data on PSM are taken from the Merit Principles Surveys (MPS) in 2005 and 2010. We choose the two waves of MPS data because they allow simultaneous measurements of agency autonomy, PSM, and organizational performance when combined with data from other sources (see below). The MPS surveys were conducted by the U.S. Merit Systems Protection Board (MSPB) as a government-wide survey of federal employees that covers various workforce issues, including work motivations. The MPS data have been widely used to measure PSM in prior studies (Naff and Crum 1999; Brewer and Selden 2000; Park and Rainey 2008). The 2005 MPS sample covers 59 federal agencies and 31,277 individual observations. The 2010 MPS sample contains 61 federal agencies and 42,020 individual observations.

In the MPS surveys, the PSM-related questions have changed over time. Following previous studies (Naff and Crum 1999; Brewer and Selden 2000; Park and Rainey 2008), we construct PSM measures based on data availability and use different measures in the 2005 MPS sample and the 2010 MPS sample. While the PSM measures differ from the widely used multidimensional PSM scales, scholars have found that unidimensional PSM scales are generally reliable (Wright, Christensen, and Pandey 2013; Kim 2017).

The 2005 MPS sample has a survey question, ‘How important are each of the following in motivating you to do a good job?’ The three relevant options include ‘my duty as a public employee’, ‘personal pride or satisfaction in my work’, and ‘non-cash recognition (e.g. letter of appreciation, plaque)’. According to Park and Rainey (2008), these questions measure norm-based motives, affective motives, and intrinsic rewards, respectively. We further add the question, ‘The work I do is meaningful to me’. While this item indicates job satisfaction (Naff and Crum 1999; Jung 2014), it can measure PSM. Each answer is reverse coded so that 1 indicates ‘very unimportant’ and 5 indicates ‘very important’. The Cronbach’s Alpha for the four items is 0.60. Since a small number of indicators tend to reduce the values of Cronbach’s alpha (Tavakol and Dennick 2011), the value of Cronbach’s alpha seems acceptable. It also falls in the range of the Cronbach’s alphas reported in previous studies (DeHart-Davis and Pandey 2005; Vigoda-Gadot 2006).

For the 2010 MPS sample, following Brewer and Selden (2000) and Wright, Christensen, and Pandey (2013), we construct a PSM index based on the question, 'Please indicate your level of agreement or disagreement with the following statements'. The four relevant options include: '1) meaningful public service is important to me; 2) I am not afraid to go to bat for the rights of others even if it means I will be ridiculed; 3) I am often reminded by daily events about how dependent we are on one another; 4) making a difference in society means more to me than personal achievements'. These questions capture four theoretical dimensions of PSM described by Perry (1996), including commitment to the public interest, social justice, compassion, and self-sacrifice, respectively. These dimensions are broadly consistent with the norm-based motives, affective motives, and intrinsic rewards as measured in the 2005 MPS data. Each answer is reverse coded such that 1 indicates 'strongly disagree', and 5 indicates 'strongly agree'. The Cronbach's Alpha for the four items is 0.70.

To construct a measure of PSM from the multiple indicators, we use average standardized scores. We standardize each indicator to remove the effects of the variation in units of measure. We then average the standardized scores based on the number of indicators to reach a *PSM Index*. It indicates the number of standard deviations above or below the sample average. This approach has been widely used in the literature, for example, in constructing the Squire Index in measuring state legislative professionalism (Squire, 2007).

Measuring agency autonomy

Scholars have used various indicators of agency autonomy (Meier 1980; Aulich, Batainah, and Wettenhall 2010; Bezes and Jeannot 2018). In the present study, we take a 'structural-instrumentalist perspective' by measuring federal agency autonomy based on institutional features. As Aulich, Batainah, and Wettenhall (2010, 215) put it, 'formal structure- the distribution of roles and functions between levels in a hierarchy and among agencies- is an important determinant of the autonomy of actors and agencies'. Similarly, Maggetti and Verhoest (2014) argue that autonomy can be measured based on formal organizational structures.

Following Anderson and Potoski (2016), we use the agency independence index developed by Lewis (2004, 2010) to measure agency autonomy. We assume that high formal independence indicates high autonomy. For the U.S. federal agencies, as Aulich (2012: 59) points out, 'autonomy and independence have been protected through legislation that covers matters such as appointment, dismissal, and tenure of statutory officeholders'. Specifically, Lewis's agency independence index covers six major aspects²: 1) whether the agency is headed by a board or commission, 2) whether the new agency is independent or created outside of the existing bureaucratic structure, 3) whether the administrator serves for a fixed term, 4) how long that term is, 5) whether there are limitations on the type of persons who can be appointed to head the agency, and 6) the agency's proximity to the president (Anderson and Potoski, 2016).

Since the original agency independence index is available up to 1997, we extend the index by manually coding new data for 2005 and 2010. We focus on the 59 federal agencies in the 2005 MPS sample and the 61 federal agencies in the 2010 MPS sample. Following Lewis (2004), the data on these agency features are mainly taken from the *United States Government Manual* (USGM), a serial published by the Government

Printing Office. The Cronbach's Alpha for the six items is 0.91 in the 2005 MPS sample and 0.89 in the 2010 MPS sample. Again, we take the average standardized score approach to constructing an *Independence Index*.

Measuring agency performance

There seems no consensus on the best measures of performance. As Chun and Rainey (2005, 539) point out, 'for the U.S. federal agencies, common, relatively "objective" or quantifiable measures of performance rarely exist, making it difficult to compare agencies on performance measures'. Based on the MPS survey data, scholars have used multiple indicators to measure the perceived performance of federal agencies (Brewer and Selden 2000; Brewer 2005; Park and Rainey 2008). These indicators usually capture employees' perceived performance of their own, co-workers, supervisors, work units, or agencies.

We deviate from these studies in that the hypothesis is focused on agency-level variables. To match the units of analysis, we use employees' perceived performance of their own *agency* only. In both the 2005 MPS data and the 2010 MPS data, one question targets employees' perception of agency performance. The question is stated as 'Please indicate your level of agreement or disagreement with the following statements: My agency is successful in accomplishing its mission'. Responses are rated from 'strongly agree' to 'strongly disagree' on a 5-point Likert scale. We construct a measure of perceived agency performance based on this variable. Specifically, the variable *perceived performance* is coded so that 1 indicates 'strongly disagree' and 5 indicates 'strongly agree'. We recognize that using one variable seems less comprehensive than an index consisting of multiple indicators. Still, this question captures mission achievement as a major, intuitive dimension of agency performance (Weiss and Piderit 1999).

In addition, scholars have called for efforts to address common source bias in public administration studies (Meier and O'Toole, 2013). In this case, since the PSM measures are based on the MPS data, using data from other sources to measure agency performance becomes attractive. One widely-used performance measure of federal agencies is the Programme Assessment Rating Tool (PART) scores under the Bush Administration (e.g. Gallo and Lewis 2012; Gilmour and Lewis 2006). The PART score captures multiple dimensions of agency performance, including program purpose and design, strategic planning, program management, and program results. It provides a consistent, comparable performance measure across agencies. Compared to the employees' perceived performance measure, PART scores seem more 'objective' in that they are rated by external stakeholders than by the agency employees themselves.

We obtain the PART data of 1,018 federal programmes from 2003 to 2008 from Lewis's website, <https://my.vanderbilt.edu/davidlewis/data/>. As in Jung and Rainey (2011), we match the 2006 PART data with the 2005 MPS data to account for the one-year lag in PART implementation. For the 2010 MPS data, unfortunately, no PART data existed. To proceed, we take two approaches. First, we use the three-year moving average of PART scores to fill in the predicted PART scores in 2010. Second, we use average PART scores between 2003 and 2008 as a proxy. The first approach is preferred because it accounts for more of the temporal variation; the main results are robust with the second approach.

We match the PART data with the agency independence data and the PSM data based on agency names. We successfully match 57 of 59 federal agencies in the 2005 MPS sample³ and all the 61 federal agencies in the 2010 MPS sample. Since PART scores are measured at the program level, we aggregate the PART scores to the agency level by averaging across the programs within an agency. Thus, the second agency performance measure is the variable *PART score*, on a scale⁴ ranging from 0.00 to 1.00, with larger values indicating better performance. At the agency level, the correlation coefficients between *perceived performance* and *PART score* are 0.17 and 0.41 in the 2005 MPS sample and the 2010 MPS sample, respectively ($p < 0.01$). This is consistent with the literature that shows weakly positive correlations between subjective and objective organizational performance measurements (Selden 2004; Andrews, Boyne, and Walker 2006).

Model specification

We adopt different methods of estimation for the two measures of agency performance. First, we estimate a hierarchical linear model (HLM) for the perceived performance at the individual level, as in prior studies (Jung and Lee 2013; Jung 2014). We use HLM to estimate the cross-level interaction effects between PSM at the individual level and agency autonomy at the agency level. HLM is estimated by maximum likelihood because it accommodates clustered robust standard errors and differs only slightly from other alternatives such as restricted maximum likelihood estimation (Bryk and Raudenbush 1992).

Second, for agency performance measured as PART score, we estimate an OLS model at the agency level. It is not unusual to run agency-level analysis to test the PSM-performance link (Petrovsky and Ritz 2014; Van Loon 2016; Van Loon et al. 2018). We average individual responses within an agency to construct agency-level measures from the MPS surveys of federal employees. To test the hypothesis of conditional effects of autonomy on performance by PSM, we include an interaction term between agency autonomy and PSM.

Throughout the estimation, we use robust standard errors clustered at the agency level to account for the correlations among individual responses within the same agency. We further account for the stratified sampling structure using the respective sample weights as directed by the MPS survey designs. Moreover, the 2005 MPS sample and the 2010 MPS sample cover a different set of federal agencies and thus do not allow the construction of a panel. We run the analysis for the two samples separately to test the robustness of the results.

Consistent with the existing studies using the MPS data (Naff and Crum 1999; Brewer and Selden 2000; Park and Rainey 2008), the control variables include a set of demographic and background factors. In the 2005 MPS sample, we control for the following variables. *Education* is a categorical variable indicating the respondents' level of education from low to high.⁵ *Union member* is a dummy variable that indicates whether a respondent is a union member. *Supervisory status* is a dummy variable that indicates whether a respondent is a supervisor as defined in the MPS surveys. *Field office* is a dummy variable indicating whether a respondent works in a field office, with headquarter as the base category. *Years of service* is a continuous variable indicating the number of years a respondent has worked as a federal civil service employee.⁶ *Female* is

Table 1. Summary statistics.

VARIABLES	(1) N	(2) mean	(3) S.D.	(4) min	(5) max
<i>Panel (a) 2005 MPS</i>	31,277	3.927	0.226	3.219	4.477
Perceived performance					
PART score	31,277	0.686	0.127	0.347	0.934
Independence index	31,277	0.011	0.851	−0.346	3.388
PSM index	31,277	0.015	0.645	−4.757	1.227
Education	30,992	2.842	1.272	0	5
Minority	31,277	0.257	0.437	0	1
Female	30,957	0.408	0.491	0	1
Union member	31,277	0.564	0.496	0	1
Field office	30,857	0.745	0.436	0	1
Years of service	31,082	19.692	9.778	0	39
Supervisory status	31,277	0.461	0.499	0	1
Number of PART programs	29,364	2.665	2.968	1	15
Number of federal agencies	57				
Year	2005				
<i>Panel (b) 2010 MPS</i>	42,020	4.028	0.206	3.384	4.476
Perceived performance					
PART score	42,020	0.697	0.134	0.276	0.934
Independence index	42,020	0.015	0.951	−0.364	3.078
PSM index	42,020	0.018	0.713	−3.886	1.376
Education	41,976	4.750	1.475	1	8
Minority	42,020	0.267	0.442	0	1
Years of service	41,983	5.783	2.714	1	11
Union member	42,020	0.421	0.494	0	1
Supervisory status	42,020	0.334	0.472	0	1
Number of PART programs	42,020	2.056	3.958	1	31
Number of federal agencies	61				
Year	2010				

a dummy variable that indicates whether a respondent is a female, with a male as the base group. *Minority* is a dummy variable that indicates whether a respondent belongs to a minority group, with white as the base group.

Since the MPS surveys cover a different set of demographic variables between 2005 and 2010, we control slightly different variables in each sample. In the 2010 MPS sample, we do not control for *age*, *female*, and *field office* because the data are unavailable. When the dependent variable is the *PART score*, following Gallo and Lewis (2012), we control for an additional variable, the *number of PART programs*, which measures the number of programs evaluated under PART. When all these control variables are averaged to the agency level in the OLS estimation, the variables can be interpreted as the percent of employees in an agency who have a college degree, belong to a union or a minority group, serve as supervisors, and are female. Moreover, when running the model at the agency level, the limited number of agencies means that the degree of freedom does not allow the inclusion of a large number of control variables. We thus control for a richer set of variables in the HLM estimation than in the OLS estimation. Table 1 shows summary statistics for all the variables.

Table 2. Impact of agency autonomy and PSM on perceived performance: multi-level linear models.

VARIABLES	(1) 2005 MPS	(2) 2005 MPS	(3) 2010 MPS	(4) 2010 MPS
<i>Fixed effects</i>				
<i>Agency-level</i>				
Independence index	−0.031	−0.025	0.072**	0.079**
	(0.042)	(0.035)	(0.033)	(0.034)
<i>Individual-level</i>				
PSM index	0.368***	0.360***	0.193***	0.186***
	(0.010)	(0.011)	(0.011)	(0.011)
<i>Cross-level interaction</i>				
Independence Index×PSM index	0.004	0.024**	0.013	0.011
	(0.007)	(0.010)	(0.011)	(0.010)
<i>Individual-level control variables</i>				
Education		−0.026***		−0.015
		(0.008)		(0.011)
Union member		0.066**		0.082***
		(0.026)		(0.016)
Supervisory status		0.117***		0.102***
		(0.028)		(0.011)
Years of service		−0.001		−0.010***
		(0.001)		(0.003)
Minority		−0.056**		−0.002
		(0.022)		(0.021)
Female		0.030*		
		(0.018)		
Field office		−0.062**		
		(0.025)		
Constant	3.852***	3.956***	3.985***	4.068***
	(0.032)	(0.047)	(0.026)	(0.070)
<i>Random effects</i>				
Individual-level variance	0.641***	0.626***	0.670***	0.666***
	(0.028)	(0.025)	(0.032)	(0.032)
Agency-level variance	0.056***	0.084***	0.038***	0.038***
	(0.012)	(0.025)	(0.008)	(0.009)
ICC (intra-class correlation)	0.081	0.118	0.053	0.054
Observations (individuals)	31,072	29,502	40,266	40,210
Number of agencies	57	57	61	61

Robust standard errors, clustered by agency, in parentheses

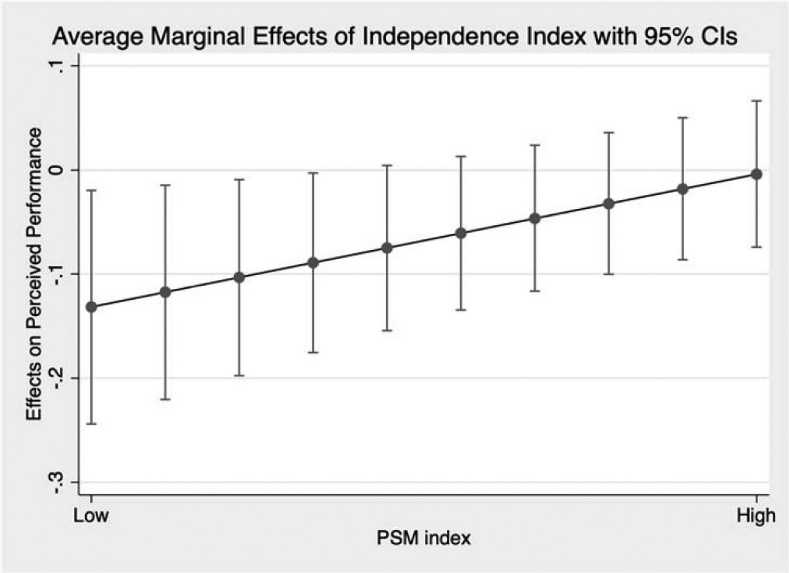
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Results of the estimation

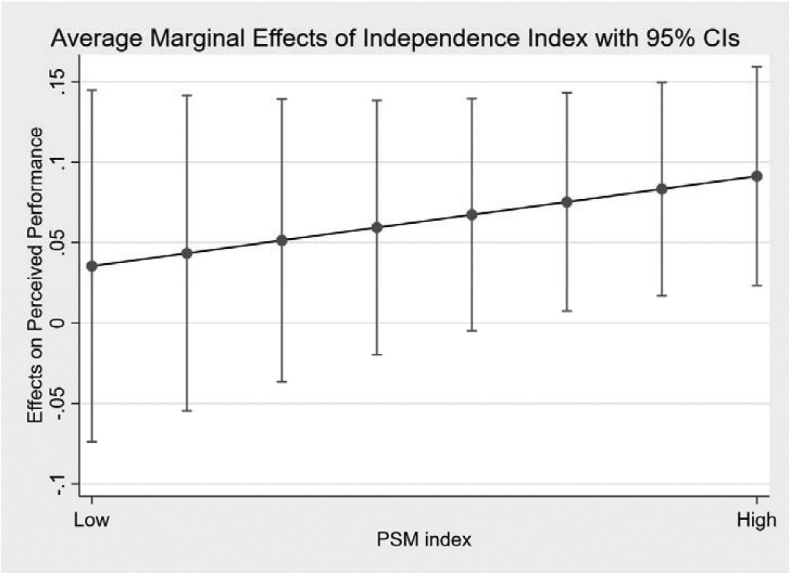
Perceived performance

Table 2 shows the results of the HLM estimation for the dependent variable of *perceived performance*. Columns (1) and (2) report the results for the 2005 MPS sample, while columns (3) and (4) present the results for the 2010 MPS sample. For each sample, the model is estimated without and with control variables. The models without control variables serve as a baseline specification, while the models with control variables are preferred. The intra-class correlation coefficients (ICC) are about 0.12 and 0.05 in columns (2) and (4), respectively, which are comparable to prior studies (Jung and Lee 2013) and indicate that the use of HLM estimation is appropriate.

As shown in columns (2) and (4) of Table 2, one key variable of interest, the *independence index*, shows a positive and statistically significant effect ($p < 0.05$) in the 2010 MPS sample. The other key variable of interest, the *PSM index*, reaches statistical significance at $p < 0.01$



Panel (a) 2005 MPS



Panel (b) 2010 MPS

Figure 2. Impact of agency autonomy on perceived performance by PSM. Panel (a) 2005 MPS Panel (b) 2010 MPS

level in both models. The interaction term between the *independence index* and the *PSM*

index is positive and statistically significant ($p < 0.05$) in the 2005 MPS sample. Figure 2 shows the average marginal effects of the *independence index* by the *PSM index* based on the results in columns (2) and (4) to facilitate the interpretation of the interaction effects.

Panel (a) of Figure 2 shows that, in the 2005 MPS sample, the *independence index* has a negative and statistically significant effect ($p < 0.05$) on perceived performance when the PSM index is relatively low. The effect becomes statistically indifferent from zero as the PSM index increases. This pattern of results is consistent with the hypothesis. In addition, panel (b) of Figure 2 shows that the *independence index* has a positive and statistically significant effect ($p < 0.05$) on perceived performance at a relatively high level of the PSM index in the 2010 MPS sample. It shows no statistically significant effect when the PSM index is relatively low. This is consistent with the hypothesis that agency autonomy has a larger, positive impact on performance as PSM in the agency increases.

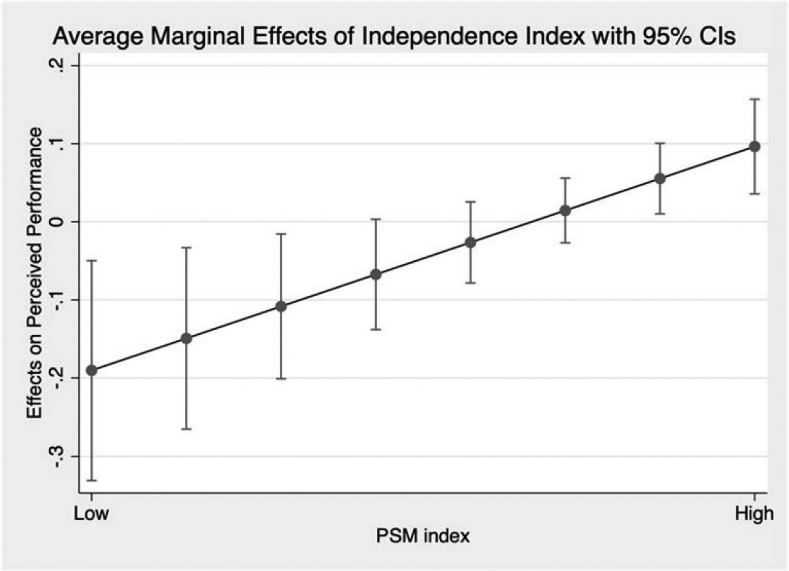
For the control variables estimated with the 2005 MPS sample, as reported in column (2) of Table 2, *education*, *minority*, and *filed office* show negative and statistically significant effects ($p < 0.05$) on perceived performance, while *union member*, *female*, and *supervisory status* show positive and statistically significant effects ($p < 0.1$). For the 2010 MPS sample, column (4) of Table 2 shows that *years of service* has a negative and statistically significant effect ($p < 0.01$), while *union member* and *supervisory status* show positive and statistically significant effects ($p < 0.01$).

Table 3. Impact of agency autonomy and PSM on PART score: OLS models.

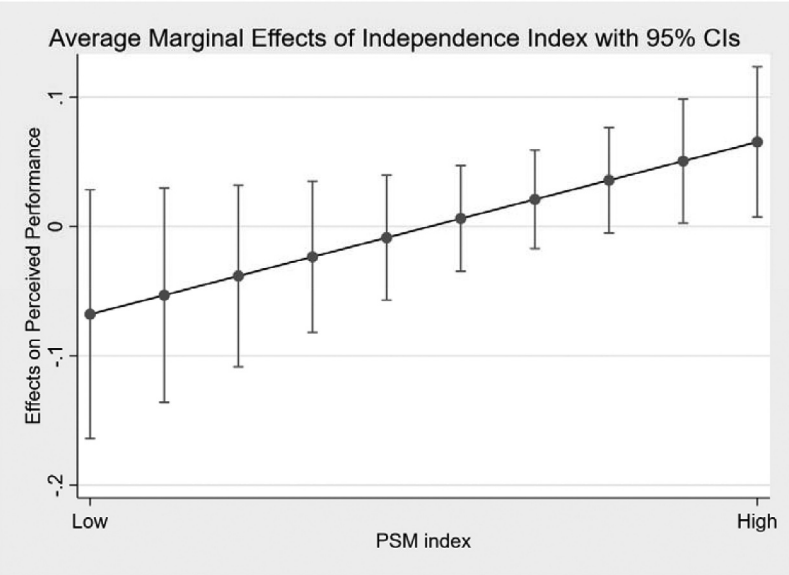
VARIABLES	(1) 2005 MPS	(2) 2005 MPS	(3) 2010 MPS	(4) 2010 MPS
<i>Key variables of interests</i>				
Independence index	−0.021 (0.025)	−0.020 (0.025)	−0.002 (0.022)	0.009 (0.020)
PSM index	−0.228 (0.356)	−0.269 (0.466)	−0.156 (0.297)	−0.259 (0.223)
Independence index×PSM index	0.862*** (0.309)	0.819*** (0.255)	0.327** (0.156)	0.296** (0.147)
<i>Control variables</i>				
College degree		0.731* (0.386)		0.209 (0.274)
Union member		−0.173 (0.230)		0.512** (0.206)
Supervisory status		−0.132 (0.320)		0.748*** (0.269)
Minority		−0.217 (0.332)		0.361** (0.173)
Number of PART programs		0.003 (0.007)		0.019 (0.015)
Constant	0.688*** (0.039)	0.648 (0.466)	0.737*** (0.035)	−0.046 (0.294)
Observations (number of agencies)	54	54	61	61
R-squared	0.114	0.230	0.055	0.262
F-test statistic	3.01	3.11	3.14	2.69

Robust standard errors, clustered by agency, in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$



Panel (a) 2005 MPS



Panel (b) 2010 MPS

Figure 3. Impact of agency autonomy on PART score by PSM. Panel (a) 2005 MPS Panel (b) 2010 MPS

PART score

Table 3 shows the OLS estimation of the effects of agency autonomy and PSM on organizational performance as measured by the PART scores. Table 3 is structured the same as Table 2. Again, the models in columns (2) and (4) are preferred. The F test statistic is statistically significant ($p < 0.05$) across all the four models, as is the interaction term between the *independence index* and the *PSM index*. Figure 3 shows the average marginal effects of the *independence index* by the *PSM index* to facilitate the interpretation of the interaction effects. Panel (a) of Figure 3 shows the results for the 2005 MPS sample, while panel (b) shows the results for the 2010 MPS sample. The results in the two panels show the same pattern. As the PSM index increases, the *independence index* shows positive, increasing effects on agency performance as indicated by the PART scores. These results support the hypothesis that the impact of agency autonomy on organizational performance increases in the PSM.

For the control variables, as column (2) of Table 3 shows, *college degree* shows a positive and statistically significant effect at $p < 0.1$ level. This indicates that agency performance is stronger when the average education level in an agency is higher. Column (4) shows that *union member* and *supervisory status* have positive and statistically significant effects ($p < 0.05$) on PART scores. This suggests that agency performance increases with the proportion of supervisors among employees, consistent with existing literature (Brewer 2005).

Robustness checks

We conduct two robustness checks. First, as Berry, Golder, and Milton (2012) argue, interaction effects can always be interpreted from either end, and scholars should do so to better test theories. To answer this call, in Figure A1 in the Appendix A, we draw a conceptual map that shows an increasing impact of PSM on organizational performance when granting higher autonomy to an agency of ‘stewards’ as opposed to that of ‘agents’. In an agency of stewards, agency problems would be less severe, and PSM would be higher and thus exert a greater influence on organizational performance. We then show the marginal effects of the PSM index on organizational performance by the independence index in the appendix. As Figure A2 and Figure A3 in the Appendix B and C show, the results have the same pattern as in Figure 2 and 3. As the independence index increases, the PSM index shows positive and larger impacts on agency performance as indicated by perceived performance and PART scores. This indicates that one condition for the PSM-performance link to materialize is the level of agency autonomy. This finding also suggests that the main models are robust to alternative interpretations of the interactive effects. Second, while we use average standardized scores to measure PSM in the main model, many scholars have used factor scores (e.g. Park and Rainey 2008). As a robustness check, we rerun the estimation using predicted factor scores after principal factor analysis. The results are robust.⁷

Discussion and conclusion

We argue that PSM constitutes a critical condition under which agency theory and stewardship theory can better explain the performance impact of agency autonomy. This argument stems from the observation that agency theory and stewardship theory

make different assumptions about the incentives of agency employees. On the whole, agency theory portrays agency employees as ‘agents’ in an economic sense, who have goal conflicts with political principals and may act opportunistically. On the contrary, stewardship theory makes a more ‘optimistic’ assumption about the incentives of agency employees. It predicts that they have low goal conflicts with political principals and low risks of opportunistic behaviours.

Bringing PSM into this debate, we argue that a high level of PSM provides one condition under which stewardship theory is most likely to hold. If agency employees are dedicated to sound public service, as in a minimal sense of PSM, and if political principals care about good public policy, then their goal conflicts should be low, resulting in an agency of ‘stewards’. When PSM is low, we argue that it is more likely to observe goal conflicts between political principals and administrative agents, resembling an agency of ‘agents’ described in agency theory. This does not mean that we equate low PSM with self-interested, rational economic agents. We expect the goal conflicts to be higher when PSM is lower because the absence of PSM would remove a critical common component in the incentives of political principals and administrative agents.

We put this proposition to test using the federal agency data from two rounds of the MPS surveys in 2005 and 2010. Agency autonomy shows a positive effect on performance only when the PSM is high. The finding is robust across two waves of MPS data, alternative PSM and agency performance measures, and estimation at both the individual and the agency levels. The finding supports both stewardship theory and agency theory. The finding is consistent with stewardship theory in that agency autonomy matters more to agency performance when PSM is relatively high. It is consistent with agency theory because the lack of positive performance effects of agency autonomy for employees with low PSM indicates that they may have acted opportunistically.

More broadly, this study speaks to the debates on whether external control or internal motivation has a larger impact on organizational performance (Friedrich 1940; Finer 1941). Finer (1941, 339) observes that autonomy of public administrators ‘calls for one or both of the available remedies: the continuing control of the representative and judicial agencies over the official and an omnipresent sense of *duty to the public* on the part of the official’ (italics added by author). The finding suggests that the two factors are interdependent. The finding shows that agency autonomy via institutional design effectively enhances performance only when agency employees have high PSM. This suggests that institutional designs and administrative reforms must account for the ‘human’ factor. Conversely, for PSM to shape agency performance, the institutional environments as indicated by agency independence matter.

We show that PSM should be accounted for when predicting the performance impact of agency autonomy. Changes in PSM in administrative agencies may result from a selection effect, in which agencies select employees with high PSM, or a socialization effect, in which agencies cultivate high PSM after the recruiting (e.g. Kjeldsen and Jacobsen 2013; Kjeldsen 2014). Policymakers may find increasing agency autonomy more effective for performance improvements when the PSM is higher. Conversely, administrative reforms that increase agency autonomy are likely to fail if employees have a low level of PSM. In such cases, as predicted by agency theory, the result-based controls may turn out to be a necessary complement.

The present study has some limitations and opens up several avenues for future research. First, we have used the 2005 and 2010 MPS data to combine the measurements of agency autonomy, PSM, and agency performance (perceived performance and PART scores). Nevertheless, the PSM index in the 2005 MPS sample has a relatively low Cronbach's Alpha (0.60). Also, due to a lack of data availability, we rely on predicted PART scores as one proxy for agency performance in the 2010 MPS data. Future research may use more fine-grained measures of PSM and organizational performance. Besides, future research may use more recent data to enhance the external validity of the findings.

Second, to analyse the relationships among autonomy, PSM, and performance at the agency level, we have taken averages of the measurements when agency performance is measured by PART scores. Given the limited number of federal agencies, the data suffer from relatively small sample sizes and being cross-sectional. Future research may cover a larger sample of agencies to improve statistical power or employ longitudinal data to examine the dynamic effects.

Third, we assume that administrative agents with high PSM and policy-minded political principals show goal alignments. Nonetheless, even if administrative agents act like stewards, the principals may pursue re-election through other means than making good public policy. For example, while stewardship-oriented environmental administrators seek to improve environmental protection, their principals, driven by electoral motives, may seek to reduce environmental protection. Future research may test the boundaries of this proposition.

The findings point to a typology on agency autonomy, PSM, and organizational performance. On the two dimensions of autonomy and PSM, an agency may fall in one of four categories with differential organizational performance. When an agency scores high on both autonomy and PSM, its performance would benefit the most. When an agency has low autonomy but high PSM, the performance would not be nearly high since the lack of autonomy may crowd out such intrinsic motivations as PSM. If an agency has high autonomy but low PSM, the performance might be even decreased due to shirking by administrative agents. Finally, organizational performance would suffer if an agency is rated low on both autonomy and PSM. We have tested this framework by examining the interactive effects between agency autonomy and PSM in their impact on organizational performance. Future research may test the typology by focusing on different combinations of agency autonomy and PSM, perhaps using case studies.

Notes

1. While the MPS data for PSM measurements are available in multiple years, such as 2000, 2005, 2010, and 2016, the PART data, a critical data source to measure agency performance, are available from 2003 to 2008. We choose the years 2005 and 2010 to maximize the possibility of constructing concurrent measurements of PSM and agency performance.
2. A detailed coding scheme is available on Lewis's website, <https://my.vanderbilt.edu/davidlewis/data/>.
3. The two agencies left out are missing in the PART data.
4. The original PART scores range from 0 to 100. They are rescaled from 0 to 1 to facilitate interpretation of the results.

5. The variable *education* is treated as continuous in the HLM estimation, but the results are robust with controlling dummies for each level of education. In the OLS estimation at the agency level, this variable is recoded as *college degree*, which indicates the percentage of respondents who hold a degree that equals to associate's degree or above.
6. In the 2010 MPS sample, the variable *years of service* is a categorical variable indicating different internals of years that a respondent works as a federal civil service employee from low to high.
7. The results are available upon request.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

Figure A1. Autonomy, PSM, and organizational performance: a conceptual map.

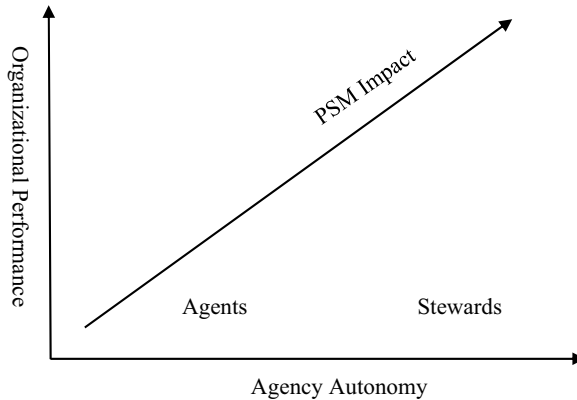
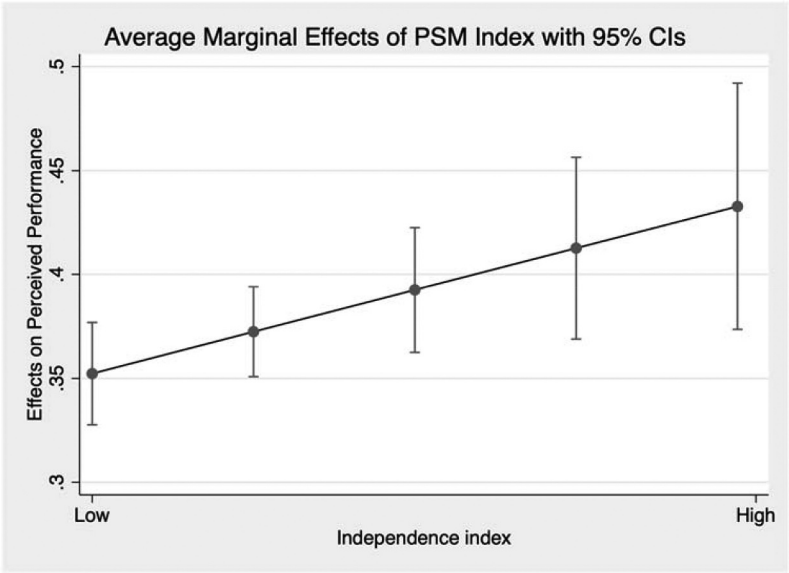
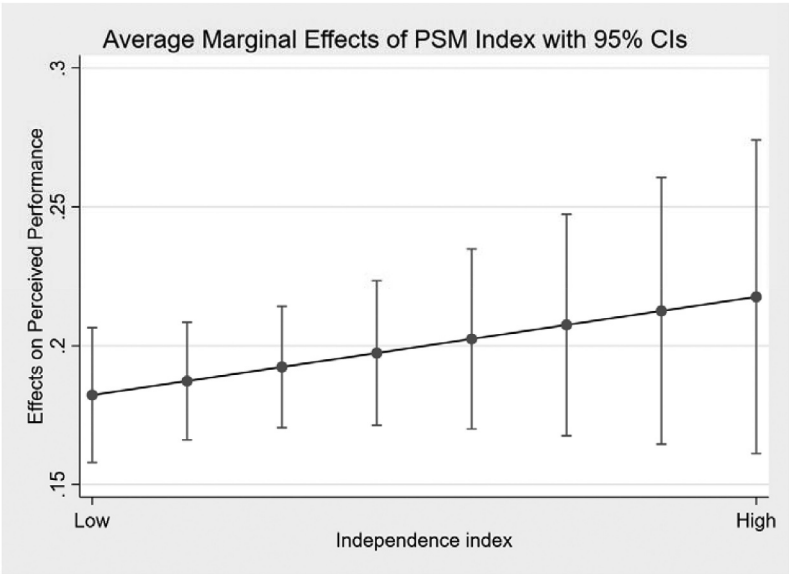


Figure A2. Impact of PSM on perceived performance by agency autonomy.
Panel (a) 2005 MPS
Panel (b) 2010 MPS

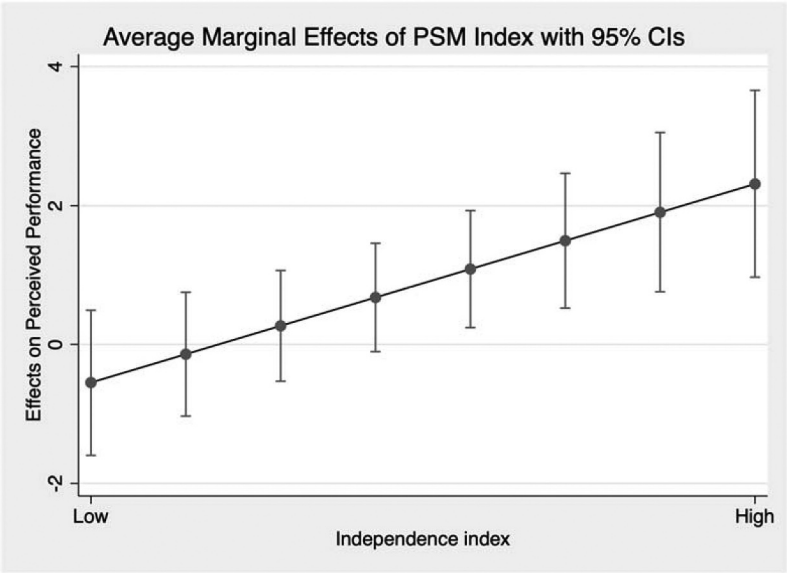


Panel (a) 2005 MPS

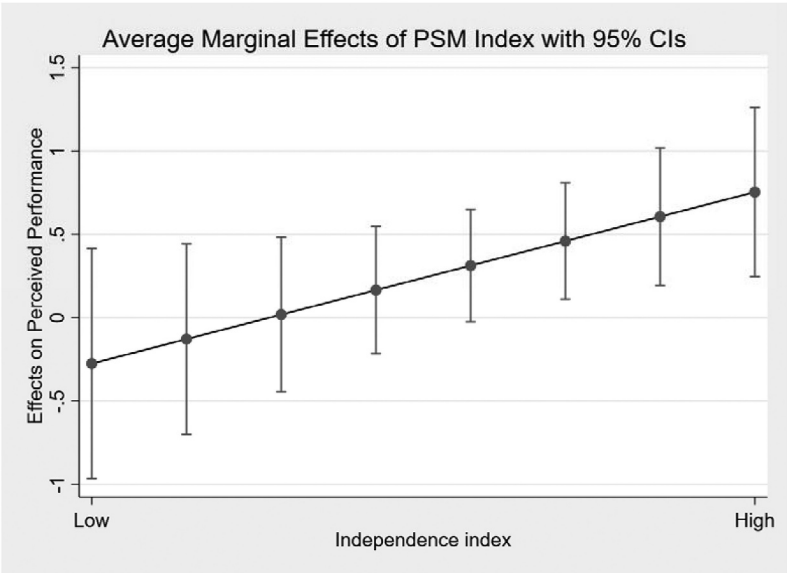


Panel (b) 2010 MPS

Figure A3. Impact of PSM on PART score by agency autonomy.
Panel (a) 2005 MPS
Panel (b) 2010 MPS



Panel (a) 2005 MPS



Panel (b) 2010 MPS