

Entrepreneurship in Public Organizations: The Role of Leadership Behavior

Abstract

Despite increasing research on entrepreneurship in the private sector, little is known about entrepreneurship in public organizations in general and the effects of leadership behavior on entrepreneurship in the public sector in particular. Utilizing new data from the Australian Public Service Commission (2017), this study analyzes how three leadership behaviors—task-oriented, relations-oriented, and change-oriented leadership—affect public sector employees' entrepreneurship behavior. The results of this study show that while all three types of leadership behavior are positively associated with public sector entrepreneurship, the effect is larger for relations-oriented leadership, followed by change-oriented leadership. A practical implication of this study is that relations-oriented leadership behavior is crucial to entrepreneurship in public organizations, suggesting the importance of developing relationships with subordinates.

Keywords: Public sector entrepreneurship; Leadership behavior; Task-oriented behavior, Relations-oriented behavior, Change-oriented behavior; public organizations.

Introduction

Public sector entrepreneurship integrates two distinct concepts: entrepreneurship and the public sector. While the former refers to opportunities for exploration and exploitation (Kearney et al., 2008; Klein, 2008; Shane & Venkataraman, 2000), the latter refers to organizations owned and funded by governments and under direct political authority (Christensen et al. 2007; Rainey 2009; Wilson 2000). Public sector entrepreneurship can be defined as “the process that exists within the public sector organization that results in innovative activities such as the development of new and existing services, technologies, administrative techniques, new improved strategies, risk taking and proactivity” (Kaerney et al., 2009, 28). Public sector entrepreneurship is critical for developing and implementing policies as demands for public service change over time. Public organizations need to be innovative and entrepreneurial in the current globalized and fast-changing environment (Arundel et al., 2015; Windrum and Koch, 2008).

Despite the importance of public sector entrepreneurship, studies have found that entrepreneurial activity tends to be low in the public sector (Osborne & Plastrik, 1997; Özcan & Reichstein, 2009; Rainey, 2009). This lack of entrepreneurial activity in the public sector is due to the risk-averse nature of public organizations and bureaucratic structures; reward mechanisms and the complexity of the working environments discourage public sector employees from being entrepreneurial (Bozeman & Kingsley, 1998; Demircioglu, 2018; Rainey, 2009; Wilson, 2000). The hierarchical structures of public organizations (Özcan & Reichstein, 2009), as well as funding constraints (Zerbinati and Souitaris, 2005), further reduce public sector entrepreneurship.

Therefore, how to increase entrepreneurship in the public sector is an important question. Research has examined how the organizational structure/bureaucracy of public organizations

(Özcan & Reichstein, 2009), tenure in public organizations (Özcan & Reichstein, 2009), and motivation (Morris & Jones, 1999) contribute to entrepreneurship in public sector organizations. At the same time, leadership in public organizations is becoming more important, as research finds that organizational leaders in public organizations can increase organizational performance, efficiency, effectiveness, and public value creation (Jensen et al., 2019; Moore, 1995; Tummers et al., 2018; Van Wart, 2014). However, studies tend to overlook what dictates public sector employee's entrepreneurial behavior, in general, and how leaders' behaviors affect entrepreneurial activity in the public sector, in particular. These studies have not suggested how public sector entrepreneurship can be increased despite the structures and incentives of public organizations that discourage entrepreneurial behavior. To fill this important gap in the literature, this study addresses the following research question: *Are certain leadership behaviors more conducive to entrepreneurial activity in the public sector?* Since the leaders of an organization play an important role in creating an organizational culture of innovation, understanding leadership behavior is critical for both organizations and stakeholders. Accordingly, it is important to understand *which* types of leadership behavior to promote and *how* these behaviors influence other members of an organization.

The relationship between leadership and public sector entrepreneurship is worth analyzing because leaders' behaviors can play an important role in promoting entrepreneurial activity in public organizations. Their behavior can affect public organizations not only in terms of organizational survival, success, performance, efficiency, and the creation of public value (Fernandez, 2008; Lewis, 1980; Moore, 1995; Ostrom, 2005; Rainey, 2009; Van Wart, 2003, 2013, 2014; Wilson, 2000); leaders also influence how effectively and efficiently organizations provide services to their constituents in a funding-constrained environment (Zerbinati and

Souitaris, 2005), and leaders also possess significant decision-making authority and responsibility (Covin et al., 2019). Leaders are also an important source for acquiring resources, changing strategies based on knowledge of the changing environment (Covin et al., 2019), and motivating employees to be entrepreneurial through incentives and creating an entrepreneurial culture (Bernier & Hafsi, 2007; Kim, 2010; Sahni et al., 2013). Therefore, it is increasingly important to promote entrepreneurial behavior in the public sector in order for public organizations to serve their constituents effectively (Mack et al., 2008).

Our study contributes to entrepreneurship literature by focusing on the public sector context and by demonstrating that certain characters of a leader help to build an organization's capability in the public sector. In this study, we propose that task-oriented, relations-oriented, and change-oriented leadership behavior influence entrepreneurship in public organizations. Task-oriented behavior focuses on completing activities that are needed to achieve a goal. Relations-oriented behavior promotes building the relationships needed for accomplishing goals, and change-oriented behavior promotes innovation and change and helps participants to cope with change. The results of our study particularly suggest that a bureaucratic leader who is relations-oriented and change-oriented will help to promote entrepreneurial capability in a government agency.

This study also contributes to strategic management literature by demonstrating that a leader's behavior can help to develop and transform existing resources to increase the capability of an organization. The results of this study suggest that relations- and change-oriented leaders can help to unlock human potential—in this case, entrepreneurial behavior among public employees. Overall, the results of our study demonstrate that relations-oriented and change-oriented leadership is important for entrepreneurship in the public sector. To start and maintain

entrepreneurial activity in an organization, the relations-oriented and change-oriented leader will promote training that increases the knowledge, ability, and skills of the employees.

Public Sector Entrepreneurship

Some scholars divide public entrepreneurs into the categories of a political entrepreneur, bureaucratic entrepreneur, executive entrepreneur, and policy entrepreneur (Holcombe, 2002; Kropp & Zolin, 2008; Lewis, 1980; Roberts, 1992). Other scholars view public sector entrepreneurs in terms of the role they play. For example, Klein et al (2010) suggest that public sector entrepreneurs play four different roles: rules of the game, new public organization, creative management of public resources, and spillover of private actions to the public domain. Similarly, Dhliwayo (2017) suggests that public sector entrepreneurs serve three different roles: economic facilitation and regulation, civil-political service agent, and commercial market participation.

We define a public sector entrepreneur as follows: in order to achieve an organization's objective, an employee works beyond what is required in his/her job, goes the extra mile, and suggests ideas or policies that improve how the organization and its members work. This definition considers entrepreneurship in terms of the roles employees play and aligns with the studies of Morris and Jones (1999), in which public sector entrepreneurs find improved ways to provide public services by combining and exploiting public and private resources and creating value for the organization and citizens. Similarly, our definition aligns with Robert's (1992) claim that the entrepreneurial process in the public sector has (a) creation phase (new idea), (b) design phase (prototype), and (c) implementation phase (innovation). Therefore, a public sector entrepreneur can explore and exploit opportunities (Kearney et al., 2008; Klein, 2008; Leyden & Link, 2015; Shane & Venkataraman, 2000), is involved in innovative activities (e.g. providing

new ideas), is proactive (Hayter et al., 2018; Kearney et al., 2009), and performative (Clausen, 2020). In fact, in order for public sector entrepreneurs to find improved ways to provide services, they would have to come up with new ideas, create a design, and manage the resources necessary for bringing ideas to fruition (Hayter et al., 2018).

Significance of Leadership and Leadership Behavior

Yukl defined leadership as “the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives” (Yukl, 2002, 3). Managers in public organizations play an important role because they represent “a particular form of leadership focused primarily on problem-solving and putting heterogeneous processes together in complementary and effective ways” (Ostrom, 2005, p. 1) setting an organization’s strategic goals and making day-to-day decisions along with communicating these goals to employees (Fernandez, 2008). In order to accomplish organizational goals, leaders treat employees with respect and help to develop employees’ skills and capabilities (Boyne, 2003; Fernandez, 2008)

Studies have identified three types of leadership behavior: task-oriented, relations-oriented, and change-oriented leadership behavior. *Task-oriented leadership behavior* is associated with accomplishing goals set by the group and following the steps to achieve the goal. Fernandez et al. (2010, 311) defined task-oriented leadership as “setting and communicating goals and performance standards; planning, directing and coordinating the activities of subordinates; maintaining clear channels of communication; monitoring compliance with procedures and goal achievement; and providing feedback.” *Relations-oriented leadership behavior* focuses on the well-being of the subordinates and the empowerment of the employees. These types of leadership behaviors foster supportive work-environment (Fernandez, 2008; Fernandez et al.,

2010). *Change-oriented leadership behavior* is associated with “adapting to change in the environment; increasing flexibility and innovation; making major changes in processes, products, or services” (Yukl, 2002, 65). The following sections will discuss how these leadership behaviors affect entrepreneurship in the public sector.

Task-oriented Leadership and Public Sector Entrepreneurship

Task-oriented leaders have appropriate knowledge and skills, along with the ability to communicate to fellow employees that they need to be willing to provide improved or innovative ways to provide services to their constituents. Task-oriented leaders are visible and engaged in achieving organizational goals (Dhliwayo, 2017). Research suggests that “a shared sense of engagement” (Barrick et al., 2015, p. 112) can be “contagious” and “transferable” among the members of an organization. Public sector entrepreneurial activity requires not only task identification and providing strategic direction but also coordination among employees. To generate entrepreneurial activity, leaders need to be able to motivate, design tasks, delegate, and coordinate human resources (Currie et al., 2008). They are also able to effectively manage “setting goals, allocating labor, and enforcing sanctions. They initiate structure for their followers, define the roles of others, explain what to do and why, establish well-defined patterns of organization and channels of communication, and determine the ways to accomplish assignments” (Bass, 1990, 472).

While skills and engagement are important components of task-oriented behavior, task-oriented leaders are also able to effectively communicate the organization's goals (an important component of achieving an organization's goals) (Fernandez, 2008). By communicating effectively with team members, he/she is better able to establish a common goal by “making the employees want to contribute to realizing the vision” (Jensen et al., 2019, p. 8). These types of

leaders also establish a well-defined channel of communication, which can promote a greater understanding of tasks, expectations, and rewards (Klein et al., 2001). Guzzo et al. (1993) established that discussion and open dialogue among team members helps to establish and clarify team goals. Because the public-sector entrepreneurial activity is influenced by employees' motivations, communication, and the leader's vision (Hayter et al., 2018; Morris & Jones, 1999), task-oriented leadership can increase entrepreneurship.

At the initial stage of undertaking any entrepreneurial activity, the nature of the team and individual tasks may not be well-defined and uncertain conditions may exist. So, team potency, efficacy, communication, and cohesion can be helpful in overcoming various obstacles (Ensley & Hmieleski, 2005; Rajan & Zingales, 2001). Task-oriented leaders behavior can help with developing both team cohesion (“a shared belief in a group’s collective capability to organize and execute courses of action required to produce given levels of goal attainment” [Kozlowski & Ilgen, 2006, 90]) and team potency (the belief of a team that it can perform the task and accomplish the goal [Guzzo et al., 1993; Pearce et al., 2002; Ensley & Hmieleski, 2005]). Team cohesion helps to create stability and interpersonal relationships among team members. As suggested by Smith et al. (1994, 432), the best teams “operate as efficient clans not needing to expend extra energy or resources on group maintenance.” Thus, task-oriented leadership can increase employees’ knowledge and ability to be entrepreneurial while providing a strategic direction for the agency that is sufficiently visible to employees. Based on the insights of previous studies, the first hypothesis will be the following:

Hypothesis 1: Task-oriented leadership behavior is positively related to public sector entrepreneurship.

Relations-oriented Leadership and Public-Sector Entrepreneurship

Relations-oriented leaders focus on creating an environment that allows subordinates to flourish by empowering and encouraging their subordinates; for example, treating employees with respect, managing diversity in the workplace, inviting employees to express an opinion, and helping to develop employees' capability, knowledge, and skills.

Relations-oriented leaders encourage an organizational culture in which knowledge, knowledge sharing (Bowen and Lawler, 1995), and "task interdependence" (Thompson, 1967) create an organizational culture in which members of the organization accept diverse views. Cyert and March (1963) argue that in an organization, individuals learn from each other through interactions and knowledge sharing. Through this interaction, organizational members can embrace each other's opinions and share knowledge from previous and new experiences, as well as knowledge acquired through different sources; thus, their capabilities and skills can increase.

Relation-oriented leaders will create a social climate in an organization in which members are able to frequently interact and exchange their ideas, thus developing their capabilities (Ashkanasy et al., 2000; Collins & Smith, 2006; Nahapiet & Ghoshal, 1998; Smith et al., 2005) to complete assigned tasks or plan for future tasks. Relations-oriented leaders create opportunities for employees to develop social networks, invest in human capital, support opportunities for all members of the organization (e.g. women and those with diverse backgrounds), and behave in an accepting manner. Relations-oriented leadership is positively associated with empowerment, participation, job satisfaction, motivation, commitment, and higher performance (Fernandez et al., 2010), so it can help to increase entrepreneurship in the public sector. Therefore, we hypothesize as follow:

Hypothesis 2: Relations-oriented leadership behavior is positively related to public sector entrepreneurship.

Change-oriented Leadership Behavior and Public-sector Entrepreneurship

Engagement in public sector entrepreneurial activity requires employees and public managers to come up with more innovative solutions to existing problems (Windrum & Koch, 2008), to be open to change, and to manage organizational change (Fernandez & Rainey, 2006; Kettl, 2005). This change orientation requires leaders to not only process information differently but also to share this vision with employees. Public sector entrepreneurial activity requires leaders to be visionary, innovative, change-oriented, and “to expand people’s mental horizon; it helps connect them to their broader, more distant goals and helps highlight the relevance of these concerns in the present” (Wiesenfeld et al., 2017, p. 369). Change-oriented leaders can encourage employees to be more creative and entrepreneurial by being more future-oriented (Fernandez, 2008; Fernandez et al., 2010; Roberts, 1992; Wiesenfeld et al., 2017) and thus more entrepreneurial.

Organizational change and entrepreneurial activity involve uncertainty and risk, and entrepreneurial activity requires exploring and exploiting opportunities (Covin & Slevin, 1989; Kirzner, 1997; Shane & Venkataraman, 2000). Exploration and exploitation require that organizations adapt to change. For public sector organizations, changes can be due to the external or internal environment, and entrepreneurs in public organizations focus on change and innovation in their organizations (Lewis, 1980, Sahni et al., 2013). As Kearney et al (2008, 302) argue, public sector entrepreneurship is “envisioned to be a process that can facilitate the effort of an organization to constantly innovate and effectively cope with changes that occur in both the internal and external environment.”

Public sector organizations need to adapt to their environment by modifying their available resources and strategies. Change-oriented leaders are better able to adapt to the changing environment by developing the absorptive capacity of the organization (Zahra & George, 2002). The absorptive capacity of an organization is “a set of organizational routines and processes...[to] acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability” (Zahra & George, 2002, 186). To create and increase the absorptive capacity of an organization, change-oriented leaders can help to improve the skills and entrepreneurial behavior of employees such that employees can recognize the value of new opportunities and apply their knowledge to increase entrepreneurial activity (Cohen & Levinthal, 1990). Therefore, we hypothesize the following:

Hypothesis 3: Change-oriented leadership behavior is positively related to public sector entrepreneurship.

Methodology

Data

Data for this paper was collected from the 2017 Australian Public Service Commission’s (APSC) State of the Service Employee Census. As of June 2017, 152,095 employees were working in the Australian Public Service (APS). However, employees who recently started or left, employees who were on long-term leave, employees with invalid email addresses, and employees who wanted to be removed from the sample are excluded from the survey. Therefore, 140,031 employees were invited to participate in the survey between May 8, 2017, and June 9, 2017. 98,943 employees responded (some were partially completed), giving a response rate of 71 percent (APSC, 2017).

Due to non-random missing variables, our final sample size becomes 81,764. The rate of missing data is consistent across all the variables used in this study. For example, in the census, 89,701 employees (59%) were women and 62,380 employees were men (41%), which is consistent with the sample that we used. Similarly, according to the census, 2% of employees were SES and 27% were EL employees, which is consistent with the sample. Around 40% of employees were working in the ACT, consistent with the sample. Furthermore, the mean values of other control variables, such as tenure, are very similar to the census, suggesting that the sample is representative of the population.

The APSC data is relevant to this study because the APS prioritizes innovation and entrepreneurship in public organizations, which is reflected in both recent scholarly work (e.g. Bankins et al., 2017; Demircioglu, 2017; Wills & Halligan, 2008; Newnham, 2018; Wipulanusat et al., 2018, 2019) and in reports published by the Australian government (e.g. APSC, 2011, 2017; Australian Government, 2009, 2010). In addition, public managers in Australia have high autonomy and are empowered to make decisions, particularly when it comes to encouraging employees to be creative and entrepreneurial. For instance, since the 1980s, the Australian government has been well-known for its “let managers manage” approach (Kettl, 2005), characterized as a greater emphasis on the role of public sector leaders. This approach focused on increasing the visibility, communication skills, and discretionary power of leaders; loosening up constraints for organizational activities and decision-making; and managing change in organizations (Aoki, 2015; Kettl, 2005; Ocampo, 1998)

An important goal of this census survey is to give government employees an opportunity to express their views about their job experience, along with their views on the attitudes and behaviors of their colleagues and the leaders of their agency.

Variables

Our dependent variable is entrepreneurship, which is measured by three survey items. A sample item is the following: “I suggest ideas to improve our way of doing things.”

Operationalization and detailed descriptions of all variables used in this study are demonstrated in Table 1. In this study, public sector entrepreneurship items measure whether employees are proactive and suggest ideas as well as whether employees go beyond what is required in their job description, consistent with our definition.

[Insert Table 1 about here]

Independent variables are three leadership characteristics as identified by Yukl (2002) and developed and operationalized by Fernandez (2008). These are task-oriented leadership, relations-oriented leadership, and change-oriented leadership. Each of these items was measured using a five-point Likert scale (from 1 = strongly disagree to 5 = strongly agree). A sample item for task-oriented leadership is “In my agency, the Senior Executive Service (SES) set a clear strategic direction for the agency”; a sample item for relations-oriented leadership is “My supervisor helps to develop my capability”; and a sample item for change-oriented leadership is “Change is managed well in my agency.”

Cronbach’s alpha scores (which aim to measure the internal consistency of survey items with certain constructs, the three leadership characteristics in this study) for these items are 0.83, 0.82, and 0.79, respectively, demonstrating that the scales used in this study have good reliability. In other words, as the alpha scores are high in this study, the survey items that measure the three types of leadership characteristics have shared covariance, and the survey items measure the same underlying concepts (task-oriented, relations-oriented, and change-oriented leadership). Furthermore, to test the construct validity (i.e. whether survey items are

measuring underlying concepts), convergent and discriminant validity assessments were conducted. While the former measures of constructs/items are related to each other (convergence between similar items), the latter measures of constructs/items are not related to each other (instead they discriminate between dissimilar constructs, such as discriminating between task-oriented and relations-oriented leadership) (Trochim, 2006). The findings demonstrate that there is no problem with convergent and discriminant validity because all average variance extracted (AVE) values are larger than both 0.5 and squared correlations among three latent variables (Appendix A).

We have included several control variables to account for organizational-level and individual-level effects. Previous research on entrepreneurship suggests that the size of the organization, work location, and types of agencies have a direct impact on entrepreneurial activity in an organization (Hornsby et al., 2002; Kearney et al., 2008). Individual-level controls include respondents' gender, job level, tenure, education, and gender (e.g. Acs & Audretsch, 2003; Chowdhury et al., 2018; Hornsby et al., 2002; Terjesen et al., 2016; Zampetakis & Moustakis, 2007). Table 2 presents detailed descriptions of all our variables.

Table 2 reports descriptive statistics, and Table 3 reports the correlation coefficients of all the variables used in this study. The mean value of entrepreneurship is 4.05, which is slightly higher than task-oriented leadership (mean=3.49), relations-oriented leadership (mean=3.97), and change-oriented leadership (3.41). Most employees are working in a large organization (agencies in which more than 1,000 employees are working), are front-line employees (APS 1-6), work outside of the Australian Capital Territory (ACT) (mean of the ACT=0.4), are women (mean=0.6), and are working in a large operational agency (e.g. Department of Human Services and Department of Defense) followed by a policy agency (e.g. Department of the Prime Minister

and Cabinet, Department of Finance, and Department of Health). Fewer employees are working in a small operational agency (e.g. Australian Financial Security Authority and Comcare), regulatory agency (e.g. Australian Securities and Investments Commission and Clean Energy Regulator), and specialist agency (Australian Bureau of Statistics and National Museum of Australia).

[Insert Table 2 about here]

[Insert Table 3 about here]

Empirical Strategy

We used ordinal logit regression since our dependent variable is an ordinal scale but there is not necessarily equal distance between values (Long, 1997). Due to heteroscedasticity (which refers to when the estimated standard errors are non-constant and the coefficients are unbiased but imprecise), the robust standard error was used for estimations (Verbeek, 2008). To test whether a multicollinearity problem exists, we calculated the variance inflation factor (VIF) scores, which provide an index that measures how much the variance of a regression coefficient is increased because of collinearity (and measures the extent of correlation between one variable and the other variables in a model). All VIF scores are less than the cutoff point of 10, and the mean VIF score is 2.2, suggesting that multicollinearity does not exist in this study (Neter et al., 1996).

Because the dependent and independent variables are from the same survey, we have analyzed whether a common method variance bias exists. Common source variance is a “variance that is attributable to the measurement method rather than to the constructs the measures represent... For example, let’s assume that a researcher is interested in studying a hypothesized relationship between Constructs A and B... [i]f the measures of Construct A and

the measures of Construct B also share common methods, those methods may exert a systematic effect on the observed correlation between the measures” (Podsakoff et al., 2003, 879). In other words, if all variables come from the same data, there may be systematic error variance shared among variables. Research suggests that if both variables are from the same data, the best way to handle common source bias are procedural remedies, including assuring confidentiality, respondent anonymity, improving scale items, representativeness, and using a pre-tested survey (Favero & Bullock, 2015; George & Pandey, 2017; Podsakoff et al., 2003).

The Australian Public Service Commission (APSC) has strict rules in place to protect the anonymity and privacy of the respondents. In addition, pilot tests were conducted before distributing the survey. Furthermore, the APSC has collected data since 2002, and there are several teams (team members include psychometricians, sociologists, public management experts, and many others) working on developing and improving survey items. Additionally, ex-post-tests (e.g. confirmatory factor analysis and Harman’s single factor test) demonstrate that common source bias should not be a serious issue. For example, the findings show that no problems exist for the convergent or discriminant validity, which can reduce common source bias (Conway & Lance, 2010). Furthermore, we have employed Harman’s single factor test. The findings show that a single factor does not emerge (e.g. the highest factor score is less than 0.34). Regarding social desirability bias, based on the Privacy Acts, the data is strictly confidential, and no one could identify individual responses. Only aggregated responses from the agencies more than 100 employees are reported. Similarly, respondents do not have any reason to misrepresent their or their managers’ attitudes and behavior, or demographic variables such as gender. Nevertheless, as the survey aims to measure employees’ attitudes and behavior (not objective

information), some employees may overstate or understate their attitudes; thus, social desirability bias cannot be totally eliminated although it should not be a major concern.

Results

The results of the ordinary least squares (OLS) and ordinal logit model (OLM) analysis are presented in this section of the paper. The results of the OLS and OLM are very similar to one another; we report the findings of OLS unstandardized coefficients in Table 4 and the findings of the odds ratios from the OLM in Table 5. There are three models. The first model (Model 1a and 1b, Table 4) reports the result for responses from all employees. However, because entrepreneurship can be seen as a medium to high-level phenomenon, we also report the findings for only middle-level managers (Executive Level [EL] 1-2) in the second model (Model 2a and 2b) and only senior managers (Senior Executive Service [SES]) in the third model (Model 3a and 3b). While Model 1a, Model 2a, and Model 3a in Table 4 include only control variables, Model 1b, Model 2b, and Model 3b include both independent and control variables. The findings of all employees in the APS are reported in the first models (Model 1a and Model 1b), EL employees are reported in the second models (Model 2a and Model 2b, respectively), and the findings of the SES employees are reported in the third models (Model 3a and Model 3b).

According to OLS regression results (Table 4, Model 1b), one unit increase in task-oriented, relationship-oriented, and change-oriented leadership increases the predicted value of entrepreneurship by 0.021, 0.191, and 0.117, respectively ($p < 0.001$), holding other variables constant. One unit increase in task-oriented, relationship-oriented, and change-oriented leadership increases the predicted value of entrepreneurship by 0.033, 0.175, and 0.105 for EL employees (Model 2b), and 0.147, 0.178, and 0.069 for SES employees (Model 3c), respectively,

holding other variables constant. In other words, both middle and senior managers are entrepreneurial when their managers are more task, relations, and change-oriented.

[Table 4 is about here]

[Table 5 is about here]

Table 5 presents the results of the odds ratio, which is more meaningful for interpreting the findings compared to unstandardized coefficients. The findings show that task-oriented leadership increases the odds of engaging in entrepreneurship by a factor of 1.064, holding all other variables constant (Table 5, Model 1). Although the effect is very small for the entire sample, the odds of engaging in entrepreneurship is 1.93 for senior managers (Table 5, Model 3). The effects of relations-oriented and change-oriented leadership are relatively similar among the three models. Accordingly, the odds of relations-oriented leadership is over 2, suggesting that relations-oriented leadership increases entrepreneurship by more than two times (for SES, it is 2.23 times). The odds of change-oriented leadership is 1.48 in the first model, 1.46 in the second model, and 1.47 in the third model, suggesting that change-oriented leadership increases entrepreneurship close to 1.5 times. We will discuss these findings in the following section.

Finally, VIF scores are less than 10, the findings support both convergent and discriminant validity for independent variables, and the correlation coefficients are high among independent variables (Table 3). For robustness checks, we have run models for each independent variable separately (e.g. Model 4 includes only task-oriented leadership and control variables, Model 5 includes only relations-oriented leadership and control variables, and Model 6 includes only change-oriented leadership and control variables). These findings (Appendix B) are consistent with the original findings that support all the hypotheses. The findings from the odds ratio (not shown) also support that the most important leadership style for public sector

entrepreneurship is relations-oriented leadership, followed by change and task-oriented leadership. These post-hoc tests demonstrate the robustness of the findings.

Discussion and Conclusion

In this study, we aimed to answer the following research question: Are leadership behaviors associated with entrepreneurial behavior among public employees? Specifically, we analyzed the effects of task-oriented leadership, relations-oriented leadership, and change-oriented leadership behavior on entrepreneurship in the public sector. Public sector entrepreneurship in this study is operationalized as employee extra-role behavior. We posited that task-oriented leadership (H1), relations-oriented leadership (H2), and change-oriented leadership (H3) are positively associated with public sector entrepreneurship. Although the findings support all three hypotheses, the findings also reveal that the most important determinant for public entrepreneurship is relations-oriented leadership, followed by change-oriented leadership.

The findings also demonstrate that although task-oriented leadership behavior has little effect on public sector entrepreneurship for front-line employees (odds = 1.06), it has a large and substantial effect for senior managers (odds = 1.93). In other words, for senior managers, when high task-oriented leadership exists, senior managers are almost two times more likely to be entrepreneurial. Top managers in the APS can be motivated by task-orientation, such as the strategic directions of the agency and the visibility of senior managers. Overall, although relations-oriented leadership is an effective leadership behavior that may lead to higher entrepreneurship among employees, employee job level affects how leadership types influence public sector entrepreneurship.

In sum, the findings across models are similar and consistent, demonstrating the robustness of the findings. Task-oriented leadership behavior has a positive and significant relationship with entrepreneurship in all three models. Similar results are visible for the other two leadership behaviors (relations-oriented and change-oriented). Overall, the findings support all of the hypotheses. Even for SES employees, where the sample size is 1,784 (less than 2% of APS employees), the findings of the independent variables are still statistically significant and meaningful while many control variables have lost statistical significance at the 5% level.

The results of our study suggest the importance of leaders' behaviors in public organizations. Effective leaders in public organizations can create an entrepreneurial climate through empowering employees, providing them with incentives, and improving employees' capabilities and motivations, such that employees can become more innovative and entrepreneurial (Demircioglu & Audretsch, 2017; Thompson & Sanders, 1997; Sahni et al., 2013). Leaders in any organization play an important role, so learning to improve their skills is critical, as suggested by Van Wart (2013, 554): "Mastering the many lessons of leadership is challenging, but those hoping to become effective leaders should be able to meet the challenges and enjoy doing so." Thus, leadership behavior is crucial for entrepreneurship in the public sector.

Leaders of an organization can build team cohesion, which is helpful for better performance and productivity. Relations-oriented leaders can help to create trust/social capital among members of the team (Collins & Smith, 2006). This trust among the members of a group can help when they are faced with a challenging situation or improving assigned tasks. For instance, strong ties allow members to receive criticism and feedback from the group and view them as constructive.

The findings also demonstrate that relations-oriented and change-oriented behaviors go hand-in-hand. The entrepreneurial activity requires adapting to change as well as managing change. Managing change in public organizations can be challenging since employees tend to be used to the routines established in the organization over many years (Fernandez & Rainey, 2006), so communication-oriented leaders can motivate employees to involve in the change process. While organizational routines can contribute positively to the success of the organization, they can also give a false sense of competence to members who may miss opportunities in a changing environment. Established routines may create problems for leaders due to employee inertia. Employees' inertia may prevent the organization as a whole from adjusting to a changing landscape, which can be detrimental for undertaking the entrepreneurial activity.

Another interesting finding is the effects of employees' current positions on public sector entrepreneurship. As mentioned earlier, the effects of job level are the second highest in the models, suggesting that managers have higher entrepreneurship compared to front-line employees. Furthermore, the findings also demonstrate that senior executives (SES) in the APS (around 2% of employees) are even more entrepreneurial than executives/middle managers (EL 1-2) in the APS (around 27% of employees) (Table 4 and Table 5). This is an important finding since there has been continuous debate as to whether managers can be entrepreneurial (Fernandez, 2008; Kim, 2010; Rainey, 2009). Our findings contribute to this discussion by demonstrating that, indeed, managers in the APS are more entrepreneurial than front-line employees. The findings imply that managers in the APS have the right skills, attitudes, and behaviors necessary for entrepreneurship. The results demonstrate the importance of human capital for entrepreneurial activity not only in the private but also in the public sector. This

finding is also consistent with studies finding that senior managers' private work experiences affect their attitudes toward management, including attitudes toward efficiency, achievement-orientation, and innovativeness (Lapiente et al., 2020).

In addition, the size of the agency is typically not statistically significant, and work locations have mixed and not meaningful results across models. However, it should also be noted that most public organizations are larger than in the private sector. These findings challenge early studies on entrepreneurship in the private sector that compared private organizations, in which types of organizations and work locations have important effects on innovation and entrepreneurship (Acs & Audretsch, 1988, 1990; Audretsch, 1998). Tenure and education are positively associated with entrepreneurship for all employees. Therefore, the findings suggest that employees' entrepreneurship can increase with their work experience and education, suggesting that entrepreneurship can be learned and improved. Another interesting finding is that women are more entrepreneurial than men. This is consistent with new studies finding that women are more entrepreneurial although men and women differ in terms of entrepreneurial behaviors (Terjesen et al., 2016). For example, Suzuki and Avellaneda (2018) analyze how the presence of female local councilors and administrative managers influence local financial decision-making. They find that the presence of female councilors leads to more risk-averse financial decision making. In other research, Lapiente and Suzuki (2017) describe women as "prudent entrepreneurs."

As mentioned earlier, most of the research on entrepreneurship is conducted at private firms, and we have limited knowledge and understanding of entrepreneurship in public organizations. As the size of organizations does not have any statistical and meaningful effect on entrepreneurship, the findings suggest that regardless of size, the main determinant of

entrepreneurship in public organizations is leadership behavior. Overall, the findings of this study imply that typically and in comparison with private organizations, in public organizations, size, work location, and agency do not have significant effects on employees' entrepreneurship, as budgets are stable, resources are secured, and organizations do not compete with each other (Rainey, 2009). What matters for entrepreneurship in public organizations is leadership and particularly relations-oriented leadership.

Limitations and Future Research Directions

This study has several limitations. Since we use cross-sectional data, findings cannot be used for a causal interpretation. Future studies may collect panel data to test the causal effects of the three types of leadership behavior on public entrepreneurship. Unfortunately, survey data from government organizations are typically cross-sectional (e.g. APS Employee Census from the APS and Federal Employee Viewpoint in the United States). In this regard, researchers may collect their own longitudinal data with large sample sizes. In addition, we use APSC data, which was collected in a developed country with a well-established rule of law. Thanks to the large and representative sample size, we are confident that the results are consistent among the APS. However, we are limited in our ability to generalize the findings of this study; readers need to be cautious about external validity in other contexts. However, some of the findings may be generalized to developed countries, particularly to Anglo-Saxon countries, and may offer insights to developing countries. Future studies may collect data in other countries, particularly non-OECD countries, to test the effects of leadership on entrepreneurship in the public sector.

This study analyzes public entrepreneurship from a management perspective. Future research may consider analyzing entrepreneurship from a policy or a macro-level perspective, such as testing institutional effects for entrepreneurship. Klein et al. (2010, 11) suggest that

future research on public entrepreneurship analyze broader, society, or macro- levels, including “the co-evolution of public and private interests, institutions, resources, activities, and governance in rule-making,” “the creation of new public enterprises,” “the innovative stewardship of public resources,” and “the public spillover benefits of private entrepreneurship.” For instance, Leong and House (2012) find that the success of public-private partnerships (PPP) in the water sector, a form of public entrepreneurship based on Morris and Jones’ (1999) definition, relies on the legitimacy enjoyed by institutions. The legitimacy of institutions, in turn, stems from rules as well as principles that must be widely shared by citizens. Across countries, water PPPs are less likely to be canceled and are likely to survive for at least a decade when the public has higher confidence in private ownership and the private sector and lower confidence in the public sector. Future research may also study public entrepreneurship using a comparative perspective, examining which countries have higher public entrepreneurship and how and why countries differ regarding public entrepreneurship. Similarly, future studies may investigate relationships between cultural factors (including Hofstede's cultural dimensions theory on public entrepreneurship).

In addition, like most studies in public management, this study relies on the perceptions of employees rather than on well-established objective criteria. On the one hand, the role of the employee determines his/her ability to be entrepreneurial and to be influenced by a leader. Therefore, it is likely that task-oriented leadership has a stronger relationship among senior managers because they are the ones who are responsible for assigning tasks. This interpretation is likely to be true for relations-oriented and change-oriented leadership because senior managers are responsible not only for assigning tasks but also for employee well-being and organizational change (Van Wart, 2014; Yukl, 2002). On the other hand, there is a possibility that managers

may have overstated that SES managers' have a high task, relations, and change leadership behavior because they are one of the leaders of the organization. Furthermore, because it is difficult to measure innovativeness and entrepreneurship in the public sector (Acs & Audretsch, 2003; Demircioglu & Audretsch, 2018; Kim, 2010; Windrum, 2008)—and due to the confidentiality of responses from government organizations and public sector employees—it is difficult to collect objective data from public sector employees. Therefore, we recommend future studies collect more objective data.

Furthermore, although there are established questionnaires for measuring entrepreneurship activities in the private sector (e.g. Covin & Miller, 2014; Covin & Slevin, 1989; Hornsby et al., 2002; Kuratko, Hornsby, & Bishop, 2005), there are no such established questionnaires to measure entrepreneurship in the public sector. In other words, there is a big gap in the measurement of public entrepreneurship. Important reasons for this paucity of measurements are the differences between the public and private sectors: it is harder to measure entrepreneurship in the public sector because the outputs and outcomes are not clear, public employees work with many constraints, and traditional public administration discourages entrepreneurship as it includes risks (Bozeman & Kingsley, 1998; Kettl, 2005; Klein, 2010; Rainey, 2009; Wilson, 2000). There are also different understandings of public sector entrepreneurship among different studies (e.g. Bernier & Hafsi, 2007; Klein et al., 2010; Lewis, 1980; Morris & Jones, 1999). However, this lack of measurement of public entrepreneurship is unfortunate because public organizations have started to express interest in pursuing innovation and entrepreneurship (Bernier & Hafsi, 2007; Demircioglu, 2017; Demircioglu & Audretsch, 2017, 2018; Kim, 2010; Sahni et al., 2013; Windrum & Koch, 2008). Thus, we recommend that researchers focus on developing measurements for public sector entrepreneurship.

Improvement in the measurement of public entrepreneurship would help to establish which individuals and agencies are more entrepreneurial than others, as well as how to increase entrepreneurship in the public sector. Future research may also collect qualitative data (e.g. in-depth interviews) to understand and evaluate the determinants and outcomes of public entrepreneurship; future studies may also collect qualitative data as to why task-oriented leadership reduces public entrepreneurship. Additionally, future studies could test the effects of other leadership behaviors—such as servant leadership and leader-member exchange (LMX) theory—on public sector entrepreneurship.

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Table and Figures

Table 1: Operationalization of Variables

<i>Dependent Variable</i>	
<i>Public Sector Entrepreneurship</i>	<ul style="list-style-type: none"> • I suggest ideas to improve our way of doing things. • I am happy to go the ‘extra mile’ at work when required. • I work beyond what is required in my job to help my agency achieve its objectives. <p>Cronbach’s alpha = 0.7</p>
<i>Independent Variables</i>	
<i>Task-oriented leadership</i>	<ul style="list-style-type: none"> • My supervisor has the appropriate level of skills, abilities and knowledge to do their job • In my agency, the SES are sufficiently visible (e.g. can be seen in action) • In my agency, communication between the SES and other employees is effective • In my agency, the SES set a clear strategic direction for the agency <p>Cronbach’s alpha = 0.83</p>
<i>Relations-oriented leadership</i>	<ul style="list-style-type: none"> • My supervisor treats people with respect • My supervisor helps to develop my capability • My supervisor invites a range of views, including those different to their own • My SES manager behaves in an accepting manner towards people of diverse backgrounds <p>Cronbach’s alpha = 0.82</p>
<i>Change-oriented leadership</i>	<ul style="list-style-type: none"> • My SES manager effectively leads and manages change • My SES manager encourages innovation and creativity • Change is managed well in my agency <p>Cronbach’s alpha = 0.79</p>
<i>Control Variables</i>	
<i>Size of agency</i>	<p>Employees size of their agencies 1=Small (less than 251 employees) 2=Medium (251-1000) 3= Large (Over 1000)</p>
<i>Location</i>	Where is your workplace? 0 = Other, 1 = Australian Capital Territory

<i>Job Level</i>	1 = APS 1-6, 2 = Executive Level (EL) 1-2, 3 = Senior Executive Service (SES) 1-3.
<i>Total Length of the Service at the APS</i>	1 = Less than five years, 2 = 5 to less than 15 years; 3 = Over 15 years.
<i>Education</i>	Highest completed education 1 = up to undergraduate diploma, 2 = bachelor's degree or higher.
<i>Gender-Female</i>	0=Male, 1=Female
<i>Types of agencies</i>	Larger operational agency (organizations with 1,000 employees or more involved in the implementation of public policy); policy agency (organizations involved in the development of public policy); regulatory agency (organizations involved in regulation and inspection); smaller operational agency (organizations with less than 1,000 employees involved in the implementation of public policy), and specialist agency (organizations providing specialist support to government, businesses and the public).

Note: All items of dependent and independent variables are from 1 = strongly disagree to 5 = strongly agree.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Entrepreneurship	4.05	0.59	1	5
Task-oriented leadership	3.49	0.85	1	5
Relations-oriented leadership	3.97	0.74	1	5
Change-oriented leadership	3.41	0.86	1	5
Size of Agency				
<i>Small (<251)</i>	0.04	0.19	0	1
<i>Medium (251-1000)</i>	0.10	0.29	0	1
<i>Large (>1001)</i>	0.87	0.34	0	1
Work location	0.40	0.49	0	1
Level of job				
<i>APS 1-6</i>	0.70	0.46	0	1
<i>EL 1-2</i>	0.27	0.45	0	1
<i>SES 1-3</i>	0.02	0.15	0	1
Tenure				
< 5 year	0.34	0.47	0	1
5-15 years	0.43	0.50	0	1
> 15 years	0.22	0.42	0	1
Education	1.54	0.50	1	2
Female	0.60	0.49	0	1
Large operational agency	0.63	0.48	0	1
Policy agency	0.22	0.41	0	1
Regulatory agency	0.05	0.21	0	1
Small operational agency	0.03	0.18	0	1
Specialist agency	0.07	0.26	0	1

N=81,764

Table 3: Correlation Coefficients

	1	2	3	4	5	6	7	8	9	10
1 Entrepreneurship	1									
2 Task-oriented lead.	0.32	1								
3 Relations-oriented lead.	0.38	0.61	1							
4 Change-oriented lead.	0.36	0.75	0.59	1						
5 Size of agency	-0.1	-0.1	-0	-0.1	1					
6 Work location	0.09	0.08	0.09	0.1	-0.1	1				
7 Level of job	0.19	0.05	0.09	0.1	-0.1	0.28	1			
8 Tenure	-0.1	-0.2	-0.1	-0.1	0.13	-0.2	0.11	1		
9 Education	0.11	0.04	0.07	0.04	-0.1	0.17	0.32	-0.1	1	
10 Female	0.01	0.06	0.01	0.04	0.01	-0	-0.1	-0	-0.1	1

N=81,764

Table 4: Regression Results: OLS Model

	All Employees		Middle Managers (EL)		Senior Managers (SES)	
	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3c
Task-oriented lead.		0.021*** [0.004]		0.033*** [0.006]		0.147*** [0.025]
Relations-oriented lead.		0.191*** [0.004]		0.175*** [0.007]		0.178*** [0.026]
Change-oriented lead.		0.117*** [0.004]		0.105*** [0.007]		0.069** [0.026]
Size of agency	-0.005 [0.006]	-0.013* [0.006]	-0.008 [0.010]	-0.013 [0.009]	-0.016 [0.029]	-0.006 [0.024]
Work location	0.003 [0.005]	-0.009* [0.004]	-0.075*** [0.008]	-0.058*** [0.008]	-0.037 [0.026]	-0.048* [0.022]
Level of job	0.205*** [0.004]	0.164*** [0.004]	-	-	-	-
Tenure	-0.063*** [0.003]	-0.024*** [0.003]	-0.044*** [0.005]	-0.036*** [0.005]	0 [0.013]	-0.01 [0.011]
Education	0.036*** [0.004]	0.037*** [0.004]	-0.014 [0.009]	-0.01 [0.008]	0.021 [0.042]	0.034 [0.036]
Gender = Female	0.041*** [0.004]	0.024*** [0.004]	0.060*** [0.007]	0.052*** [0.007]	0.031 [0.022]	0.035 [0.019]
Agency dummies	(included)	(included)	(included)	(included)	(included)	(included)
Constant	3.888*** [0.018]	2.662*** [0.022]	4.371*** [0.030]	3.176*** [0.037]	4.529*** [0.113]	2.899*** [0.135]
Adjusted R ²	0.054	0.197	0.013	0.168	0.005	0.251
N	81,764	81,764	22,350	22,350	1,784	1,784

Note: Unstandardized beta coefficients are reported. Standard errors are in parenthesis

* p<0.05, ** p<0.01, *** p<0.001

Table 5: Odds Ratio: Results from the Ordinal Logit Model

	All	EL	SES
	Model 1	Model 2	Model 3
Task-oriented leadership	1.064	1.113	1.934
Relations-oriented leadership	2.028	2.01	2.232
Change-oriented leadership	1.475	1.459	1.472
Size of agency	0.948	0.951	0.967
Work location	0.95	0.802	0.811
Level of job	1.801	NA	NA
Tenure	0.924	0.882	0.942
Education	1.123	0.97	1.174
Female	1.053	1.181	1.169
Agency dummies	included	included	included
N	81,764	22,350	1,784

Appendices

Appendix A: Confirmatory Factor Analysis

Convergent and Discriminant Validity Assessment			
<i>Squared correlations (SC) among latent variables</i>			
	Task	Relation	Change
Task	1		
Relation	0.187	1	
Change	0.57	0.359	1
<i>Average variance extracted (AVE) by latent variables</i>			
AVE_Task	0.626	No problem with discriminant validity No problem with convergent validity	
AVE_Relation	0.585	No problem with discriminant validity No problem with convergent validity	
AVE_Change	0.632	No problem with discriminant validity No problem with convergent validity	

Note: when AVE values \geq SC values there is no problem with discriminant validity. when AVE values \geq 0.5 there is no problem with convergent validity (Stata Source: Mehmetoglu, 2015).

Appendix 2: Regression Results: OLS Model with Separate Models

	Model 1	Model 2	Model 3
Task-oriented leadership	0.212*** [0.003]		
Relations-oriented leadership		0.283*** [0.003]	
Change-oriented leadership			0.227*** [0.003]
Size of agency	-0.004 [0.006]	-0.012* [0.006]	-0.012* [0.006]
Work location	0.009 [0.005]	-0.011* [0.004]	-0.004 [0.005]
Level of job	0.187*** [0.004]	0.176*** [0.004]	0.167*** [0.004]
Tenure	-0.027*** [0.003]	-0.035*** [0.003]	-0.031*** [0.003]
Education	0.044*** [0.004]	0.027*** [0.004]	0.048*** [0.004]
Gender = Female	0.018*** [0.004]	0.033*** [0.004]	0.023*** [0.004]
Agency dummies	(included)	(included)	(included)
Constant	3.088*** [0.021]	2.780*** [0.022]	3.110*** [0.020]
Adjusted R ²	0.14	0.174	0.158
N	81,764	81,764	81,764

Note: Unstandardized beta coefficients are reported. Standard errors are in brackets.

* p<0.05, ** p<0.01, *** p<0.001