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THREE ESSAYS ON INTERACTION IN PUBLIC MANAGEMENT

DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Martin School of Public Policy and Administration in the Graduate School at the University of Kentucky

By

Seungjin Choi

Lexington, Kentucky

Director: Dr. Nicolai Petrovsky, Professor of Public Policy and Administration

Lexington, Kentucky

2016

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ABSTRACT OF DISSERTATION

THREE ESSAYS ON INTERACTION IN PUBLIC MANAGEMENT

Public management is one of the most important subfields in public administration and plays a role in explaining the variations of government performance. Encouraging public administrators to get motivated through enhancing public service motivation (PSM) and collaborating with each other to accomplish their jobs and organizational objectives are key strategies to enhance the government's accountability to the public under scarce resources. This dissertation attempts to address these concerns.

First, it conducts a meta-analytical structural equation analysis with regard to the relationships among PSM, value congruence, individual work attitudes, and individual performance and finds that person-organization fit, job satisfaction, and organizational commitment have partial mediation effects on the relationship between PSM and individual performance. It contributes to the extant PSM literature in two ways: (1) it investigates the overall average effect size of each factor and (2) examines the possibility of mediating effects of key variables on the PSM-performance relationship to specify those relationships that has not yet been fully investigated.

Drawing on the findings from the first essay, the second essay theoretically clarifies the relationship between PSM and performance by suggesting a framework in which social networks among members provide an explicit mechanism linking employees' PSM with their performance and by proposing several empirically testable propositions. Conceptually, it shows that (1) the extent of the social relationships and interaction among group members and their positions within a network differ depending on the level of PSM; (2) individual employees with high PSM are more likely to complete their tasks via their central positions in a network of advice relations; and (3) group members with high PSM are more likely to complete group tasks via the density of a social network of advice relations.

In the third essay, using a data set that is a mixed panel at the school- and district-level in the state of Kentucky across the school years from SY 2002-3 to SY 2008-9, it examines the impacts of intra-organizational collaborative behavior on organizational performance. More specifically, it investigates the linear and moderating effects of the collaborative interaction between superintendents and school principals as well as the impacts of characteristics of districts on school performance. The results from this essay provide evidence supporting the propositions. This dissertation concludes by discussing academic and practical implications and suggesting future research directions.

KEYWORDS: Public Service Motivation, Performance, Social Networks,
Social Capital, Collaborative Behavior

Seungjin Choi

July 22, 2016

THREE ESSAYS ON INTERACTION IN PUBLIC MANAGEMENT

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Date

I would like to dedicate this dissertation to my wife Woojung and my family.
Without their devoted support, encouragement, and prayers, I may
not have accomplished this professional achievement.

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TABLE OF CONTENTS

Acknowledgments.....	iii
List of Tables	vii
List of Figures.....	viii
Chapter One: Introduction	1
Organization of the Dissertation	3
Chapter Two: How and When Does Public Service Motivation Influence Individual Outcomes? A Meta-Analytic Evaluation	5
Introduction.....	5
Narrative Review and Theoretical Framework.....	9
Methods.....	27
Results.....	32
Discussion.....	46
Concluding Remarks.....	53
Chapter Three: Bridging the Gap: Social Networks as a Theoretical Mechanism Linking Public Service Motivation and Performance.....	55
Introduction.....	55
Previous Literature on Public Service Motivation.....	58
Social Network Perspective	62
Theoretical Background and Propositions	68
Suggestions for Research Design.....	76
Discussions and Conclusion.....	82
Chapter Four: The Effects of Collaborative Behaviors between Superiors and Middle Managers on Organizational Performance: Evidence from Kentucky Public Schools.....	86
Introduction.....	86
Theoretical Framework and Hypotheses.....	89

Methods	106
Analysis and Results	117
Discussion and Conclusion	128
Chapter Five: Conclusion, Implications, and Limitations	138
Implications	140
Limitations and Future Research.....	141
Appendix A: Meta-Analytic Correlation Matrix	144
Appendix B: Procedure for Testing for Mediation via Structural Equation Models	145
Appendix C: Estimates of Structural Relationships for the Competing Model.....	146
Appendix D: Correlation Coefficient Matrix for the AMSP School Districts.....	147
Appendix E: Descriptive Statistics for No AMSP School Districts	148
Appendix F: Fixed Effects Panel Regression Estimates for Academic Index, Accountability Index, and Dropout Rates	149
References.....	150
Curriculum Vitae	174

LIST OF TABLES

Table 2.1 Meta-Analytic Results and Correlations for the Study Samples	33
Table 2.2 Test of Homogeneity	35
Table 2.3 Meta Regression Results.....	37
Table 2.4 Fail-safe N (the number of missing studies) Test for Publication Bias	39
Table 2.5 Egger Test for Publication Bias	40
Table 2.6 Estimates of Structural Relationships for the Best-Fitting Proposed Model	42
Table 2.7 Estimates of Mediation Analyses	44
Table 3.1 Measurement Instrument	80
Table 4.1 Descriptive Statistics for AMSP School Districts	116
Table 4.2 Fixed Effects Panel Regression Estimates for Student Achievement (AMSP)	124
Table 4.3 Fixed Effects Panel Regression Estimates for Student Achievement.....	127

LIST OF FIGURES

Figure 2.1 Conceptual Framework for Meta-Analytic Structural Equation Modeling.....	12
Figure 2.2 Structural Path Estimates for the Proposed Model.....	41
Figure 2.3 Structural Path Estimates for the Competing Model.....	45
Figure 3.1 Social Networks in a PSM-Performance Mechanism	69
Figure 3.2 Conceptual model for Individual-level Performance	73
Figure 3.3 Conceptual model for Group-level Performance	75
Figure 4.1 Theoretical Framework for the Relationship between School Leaders and Organizational Outcomes	98
Figure 4.2 Nonlinear Relationships between Student Achievement and District Spending	122
Figure 4.3 Interaction Effects Between Principal Participation and Superintendent Salary (A)	123
Figure 4.4 Interaction Effects Between Principal Participation and Teacher Salary.....	123
Figure 4.5 Interaction Effects Between Principal Participation and Superintendent Salary (B)	126

Chapter One

Introduction

It has been argued that public management influences government performance differently depending on a variety of managerial strategies and activities. Among these, an important strategy to increase the government's accountability to the public when resources are scarce is to encourage public employees to get motivated to improve their performance, fulfill their responsibilities, and deliver public services effectively, fairly, and efficiently. For instance, Perry and Wise (1990) predicted that public organizations that attract public administrators with high levels of public service motivation (PSM) are less dependent on extrinsic rewards when managing individual performance. Thus, strategies that enhance intrinsic motivation have become essential in public human resource management. Collaborative skills and behaviors for leaders and managers in public organizations have become another overarching strategy to improve organizational outcomes. For example, Derrington and Campbell (2015) found that successful policy implementation results from collaborative and active engagement of school leaders in respect to district expectations and support with regard to teacher evaluation strategies. Both concepts of PSM and collaborative behavior adopted in this dissertation reflect reciprocal interaction between work-group or organization members as a fundamental component to fully understand the causal relationships among key variables. In particular, this dissertation emphasizes an interdependence of interaction including trust with regard to the strategies for building a managerial relationship.

Trust is a necessary value to develop relationships, and it is assumed that individuals are doing some good things because they trust that their actions will be

rewarded through positive relationship development. Trust and norms of reciprocity are strongly related to the dimensions of PSM (Brewer, 2003; Houston, 2008). A body of theory and systematic evidence links PSM to a range of individual and organizational outcomes (e.g., performance, job satisfaction, and organizational commitment). However, the focus of extant PSM literature has been on studying PSM and its antecedents and consequences as an individual characteristic, with less consideration given to the interactions of the individuals involved. Many scholars argue that work interactions and relations have a substantial impact on work motivation and work outcomes (Herzberg, 1966; Salancik and Pfeffer, 1978). In other words, employees' attitudes are shaped by interactions with others in the workplace (e.g., Zhou et al., 2009) and through reciprocal interactions with their environment such as groups, jobs, and organizations (e.g., Chatman, 1989; Kristof-Brown et al., 2005). In addition, the nature and content of employees' relationships with their group members can be influenced by their jobs in light of particular patterns of interaction, cooperation, and collaboration (Mossholder et al., 2011). Accordingly, individuals' PSM and their relationships and interactions with other work group members and their organizations continuously and reciprocally affect each other through their interdependent activities. This dissertation attempts to fill these gaps in the extant literature through empirical and theoretical examinations and provides opportunities for understanding the causal PSM-relevant relationships.

Collaboration occurs when two or more social entities work together through an interactive process in order to address certain common problems and achieve at least one shared goal (Bedwell et al., 2012). Such interactive and mutual relationships may boost social capital and breed trust, which can be the beginning of successful collaboration. In

the public management field, inter-organizational collaboration has become an important issue because of a recent shift in emphasis from management within public organizations to management across organizations; therefore, there has been little attention and research on intra-organizational collaboration although public administrators are ultimately charged with achieving shared goals and tasks in collaborative settings and each participating entity plays a different role in the collaboration process (McGuire and Silva, 2015). Furthermore, collaboration within an organization can be a potential way to inspire new strategies, especially in a professional organization (Diamond and Rush, 2012; Huxham and Vangan, 2000). Accordingly, this dissertation focuses on intra-organizational collaboration because intra-organizational management may be a breeding ground for the success of inter-organizational collaboration. The theoretical discussion will contribute to the theoretical development of the collaborative management literature by employing a general perspective of collaboration and a contingency leadership perspective. The empirical findings will confirm the existence of multiple effects and support the importance of collaborative management by examining linear and nonlinear impacts of collaborative behavior.

Organization of the Dissertation

In Chapter One, I present the introduction, research questions, and significance of the dissertation. Chapters Two and Three identify empirically and theoretically the relationship between PSM and performance. Chapter Two comprehensively investigates the relationships between PSM and work attributes (i.e., job satisfaction, organizational commitment), value fit, and performance by conducting a meta-analytic structural equation analysis which provides not only overall effect sizes of each relationship but

also the big picture of such relationships. Drawing on the implication from Chapter Two, Chapter Three theoretically clarifies the relationship between PSM and performance by suggesting a framework in which social networks among members provide an explicit mechanism linking employees' PSM with their performance and by proposing several empirically testable propositions.

Chapter Four utilizes a two-way fixed effects model to empirically investigate the linear and moderating effects of the collaborative interaction between district superintendents and school principals as well as the impacts of characteristics of school districts on school-level student academic achievement in the state of Kentucky. Chapter Five concludes with a discussion of the findings, a summary of the dissertation, implications, limitations, and recommendations for future research.

Chapter Two

How and When Does Public Service Motivation Influence Individual Outcomes?

A Meta-Analytic Evaluation

Introduction

Given that public service motivation (PSM) is a construct with dynamic properties contingent on various factors such as family context, religious activities, and professional identification (Pandey and Stazyk, 2008), encouraging public administrators to get motivated to improve their performance and effectively, fairly, and efficiently deliver public services is an important strategy to increase the government's accountability to the public under scarce resources. Accordingly, testing the relationship between PSM and its outcomes such as performance, job satisfaction, and organizational commitment still remains a central concern of scholars and practitioners in the public management field. Perry and Wise's (1990) proposition that encouraging PSM would enable public organizations to provide better public service has become a foundation for various studies in public human resource management research (e.g., Leisink and Steijn, 2009; Perry and Hondeghem, 2008b; Vandenabeele, 2009). Furthermore, many scholars and practitioners have been interested in how PSM can improve the performance of public organizations and public employees (Brewer, 2010).

Since Perry and Wise (1990), a large body of theory and systematic evidence has tried to link PSM to a range of individual and organizational outcomes including job satisfaction, organizational commitment, and individual and organizational performance (e.g., Alonso and Lewis, 2001; Brewer and Selden, 1998; Bright, 2007; Kim, 2005; Naff and Crum, 1999; Petrovsky and Ritz, 2014; Vandenabeele, 2009). Some researchers have

challenged the validity of the existing evidence on the PSM-related relationships (e.g., PSM-performance; Petrovsky and Ritz, 2014). Many have found evidence of a relationship between PSM and performance (e.g., Brewer and Selden, 2000; Bright, 2007; Naff and Crum, 1999), but others have found mixed results and raised some doubts (e.g., Alonso and Lewis, 2001). Along with the effect of PSM on performance, the relationships between PSM and other individual work attitudes such as job satisfaction and organizational commitment and between those factors and performance have been demonstrated (e.g., Brewer and Selden, 2000; Kim, 2005; Park and Rainey, 2007; Ritz, 2009; Vandenabeele, 2009). However, there are still mixed results and unclear causality in terms of those relationships. In sum, although many studies have confirmed a positive relationship between PSM and performance and work attitudes, the findings have not completely dispelled the suspicion about whether there is a direct and actual influence of PSM on outcomes (Brewer, 2010; Ritz et al., 2013; Vandenabeele et al., 2014).

In recent years, several studies suggest the mediating effects of job satisfaction and organizational commitment (Vandenabeele, 2009) as well as person-organization (P-O) fit (e.g., Bright, 2007; Wright and Pandey, 2008) on the PSM-performance relationship. The concept of person-environment (P-E) fit suggests that work attitudes are the result of employees' needs being met by their work environment (Kristof-Brown et al., 2005). In the PSM literature, many studies support the propositions that job satisfaction and organizational commitment are consequences of PSM and that individual performance is improved by enhancing public employees' work attitudes (e.g., Balfour and Weschler, 1996; Bright, 2007; Park and Rainey, 2007; Pandey et al., 2008; Vandenabeele, 2009). Therefore, I may assume that the findings from the extant research

regarding the relationships between PSM and outcomes are not conclusive and thus that there might be a black-box mechanism and unknown effects (e.g., mediating and feedback effects) of other variables on the PSM-performance relationship. This paper draws theoretically on the concept of P-E fit (especially P-O fit) and the findings of Bright (2007), Pandey and his colleagues (2008), and Vandenberg (2007) to examine the mediating role of job satisfaction, organizational commitment, and P-O fit in the relationship between PSM and performance.

Consequently, this study aims to shape a better understanding of the relationships between PSM and its outcomes by conducting a meta-analytic structural equation analysis to provide a possible solution for conflicting research findings through computing mean effect sizes with regard to those components and displaying the big picture of their relationships. These issues have not yet been fully addressed by a single sample. Although two meta-analyses have been conducted (i.e., Homberg et al., 2015; Warren and Chen, 2013), their findings provide an average effect size for a single relationship, and thereby cannot fully address its actual effect size including direct and indirect effects while considering other variables. For instance, Warren and Chen raised the possibility that other factors might have more considerable impacts on performance because the mean effect size of the PSM-performance relationship was too small. The current study uses the average effect sizes to test a structural equation model of P-O fit, job satisfaction, and organizational commitment as mediators of the PSM-performance relationships. These findings may elaborate those relationships better than those from a single sample and a simple meta-analysis. Based on a large body of studies on PSM, my research questions are as follows: (1) Does PSM have a direct positive impact on

performance, job satisfaction and organizational commitment, and if so, what is the average effect size of PSM on these outcomes?; and (2) What factors have an impact on the effect size of the PSM-outcome relationships as mediating or moderating variables?

This article contributes to the extant PSM literature in two ways. One is that it examines the average effect sizes of the several PSM-outcome relationships, as opposed to a single relationship, in published and unpublished research on PSM in order to provide better parameter estimates. This approach enables us to compare those effect sizes at the same time. The other is that it investigates the possibility of complementary effects (e.g., mediating effects) of key variables (i.e., P-O fit, job satisfaction, and organizational commitment) on the PSM-performance relationship to fully explore a black-box mechanism in the PSM-outcome relationship by conducting a meta-analytic structural equation analysis¹. It would be worth investigating the presumable mediating effect of those concepts on the PSM-performance relationship because previous researchers have alleged that job satisfaction and organizational commitment are antecedents of performance, and PSM has been considered as an antecedent to these variables.

I will first discuss the concept of P-E fit including P-O fit and PSM in order to account for why I conduct a meta-analytic structural equation analysis using work attitudes such as job satisfaction and organizational commitment. I then discuss the general concepts of job satisfaction and organizational commitment as well as their relationship with performance. Hypotheses will be developed on the basis of this

¹ Meta-analysis is “a systematic, quantitative, replicable process for synthesizing numerous and sometimes conflicting results from a body of original studies” through which “researchers can (1) calculate an average effect size that summarizes the weight of the evidence present in the original research on a particular question and (2) account for why empirical results vary across original studies” (Ringquist, 2013, 3).

conceptual framework. Next, methods for a meta-analysis and structural equation model will be described and the results will be presented in light of the framework. Finally, some discussion and suggestions based upon the analyses will be provided in order to further both the academic debate on the PSM-outcome relationship and the practical implementation of the results.

Narrative Review and Theoretical Framework

Public Service Motivation and Person-Organization Fit

Concept of Public Service Motivation

Human motivation is a fundamental topic in the social sciences, and employee's motivation to work is similarly a fundamental topic in the field of organizational behavior (Rainey, 2009). According to motivation theories, motivation influences an individual's attitude and behavior, resulting in more positive outcomes (Miner, 2005). With regard to the public institutional context, for example, many public administration theorists have identified public employees' behavior with self-sacrifice, considered public interest and altruism as public employees' typical predisposition², and suggested that their attitude and behavior is influenced by PSM and that high levels of PSM lead to better performance even though the concept and application of PSM go beyond the workplace (Brewer and Selden, 1998; Houston, 2008; Perry and Hondeghem, 2008a).

² Perry and Wise (1990) suggested three types of motives with regard to PSM: rational, norm-based, and affective motives. In particular, rational motives were considered to be associated with self-interested motives (e.g., Wise, 2000; Wright and Pandey, 2008). Accordingly, it was suggested that individuals with rational motives may participate in policy formulation processes "as a way of maximizing their own need for power and self-importance or to advocate a special interest that would provide personal benefits" (Kim and Vandenabeele, 2010, p. 702). Since the theoretical background of PSM is based mainly on altruistic motives which go beyond self-interest (e.g., Brewer, 2002), rational motives are understood as motives for fulfilling private interests and thus are "ambiguous in their relation to PSM" (Kim and Vandenabeele, 2010, p. 702).

Perry and Wise (1990, p. 368) define PSM as “an individual’s predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations.” They demonstrated three foundations of PSM: rational, norm-based, and affective motives. Individuals with rational motives may be satisfied with themselves while serving the social interest through such activities as participation in policy formulation, commitment to public programs, and advocating for disadvantaged groups. Individuals with norm-based motives want to serve the public interest and have a sense of loyalty to their duty and to the government as well as a desire to pursue social equity. Finally, individuals with affective motives are willing to express commitment to programs they believe in and make sacrifices for others. Based on these motives, Perry (1996) suggests four dimensions as fundamental measurements of PSM: attraction to policy making, commitment to the public interest, compassion, and self-sacrifice.

Using Perry’s PSM concept as a foundation, some scholars have made efforts to elaborate the concept from different perspectives. In particular, Vandenabeele (2007, p. 547) encompasses various definitions of PSM as “the belief[s], values, and attitudes that go beyond self-interest and organizational interest, that concern the interest of a large political entity, and that motivate individuals to act accordingly whenever appropriate.” A common denominator of the definition is that PSM represents an internal motivation to do good for others and society. Brewer and Selden (1998) and Rainey and Steinbauer (1999) assert that the rigid demarcation of organizational boundaries with regard to the concept of PSM may become more flexible and its definition should go beyond the scope of organizational distinction. Accordingly, the application of PSM does not need to be limited to public institutional settings because PSM is an individual predisposition that is

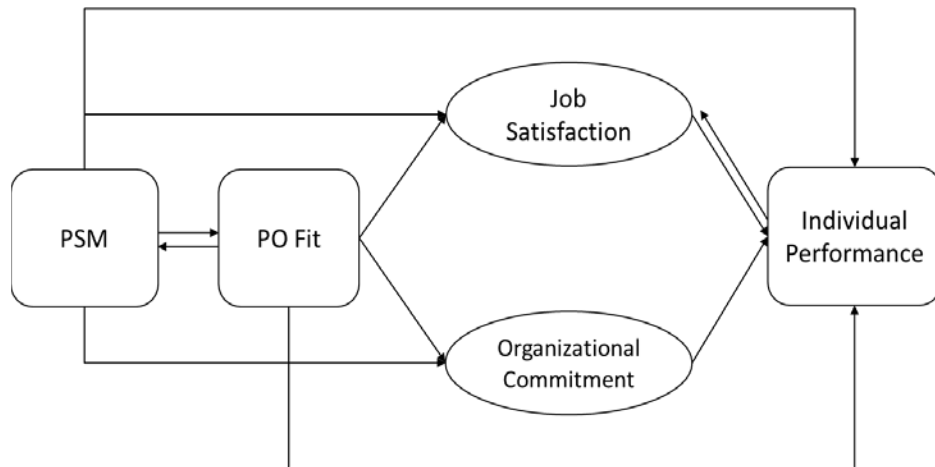
found in employees delivering public services that could be provided by various types of organizations such as public, private, and hybrid organizations.

Concept of Person-Environment Fit

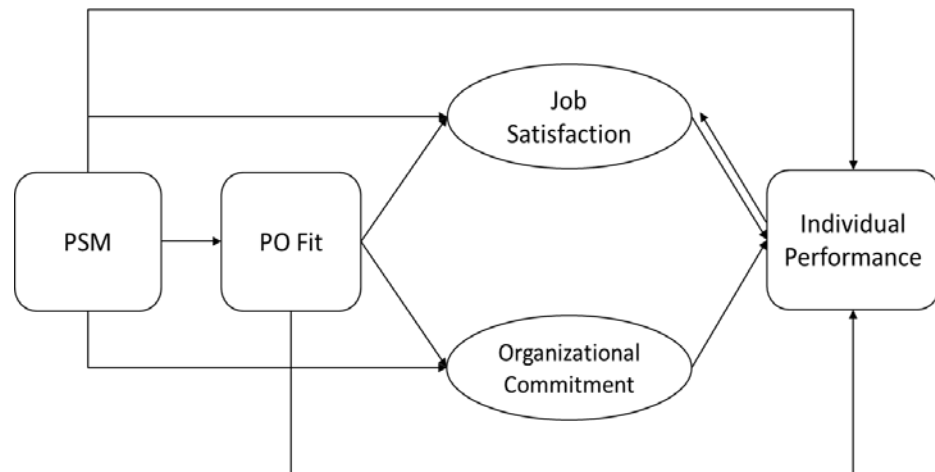
Theories of person-environment interaction provide an integrative theoretical framework for my proposed model of how PSM is associated with individual performance, especially in terms of the mediating effects of variables such as person-organization (P-O) fit, job satisfaction, and organizational commitment (see Panel A in Figure 2.1). In order to accurately elaborate and understand an individual's behavior, we need to understand both the person and his/her environment, not just one or the other (Lewin, 1951). P-E fit is broadly defined as “the compatibility between an individual and a work environment that occurs when their characteristics are well matched” (Kristof-Brown et al., 2005, p. 281). The main sub-mechanisms of the concept of P-E fit are supplementary and complementary fits (Kristof-Brown et al., 2005). Complementary fit occurs when “individuals' characteristics fill a gap in the current environment, or vice versa,” whereas supplementary fit ensues when “the individual and the environment are similar” (Kristof-Brown et al., 2005, p. 288). There are several subtypes of P-E fit between individuals and various levels of the work environment: person-vocation fit, person-job fit, person-organization fit, person-group fit, and person-supervisor fit (Kristof-Brown et al., 2005). Person-vocation fit emphasizes the congruence between individual interest and vocational choices. Person-job fit refers to the compatibility between employees' abilities and job requirements. Person-organization fit indicates the compatibility between individuals and organizational characteristics with regard to values, goals, and climate. Person-group fit emphasizes the interpersonal compatibility

between individual employees and their work groups. Finally, person-supervisor fit focuses on the dyadic relationships between employees and their supervisors. Person-organization fit has been mostly employed in PSM research in order to connect PSM with P-E fit (e.g., Bright, 2007; Kim, 2012; Vandenberg, 2007).

A. Proposed Model (PSM has a feedback effect on P-O fit)



B. Competing Model (PSM improves P-O fit)



Note: All arrows are expected to represent a positive relationship.

Figure 2.1 Conceptual Framework for Meta-Analytic Structural Equation Modeling

Public Service Motivation and Person-Organization Fit

Perry and Wise (1990) suggested three propositions about PSM³. The first two are relevant to this paper (i.e., organizational commitment and individual performance). For instance, many empirical studies support the idea that job seekers with high levels of PSM are more likely to prefer a career in the public sector (e.g., Brewer, 2003; Crewson, 1997), although some researchers investigated that PSM is not related to attraction to the public sector for their first job (e.g., Christensen and Wright, 2011; Kjeldsen and Jacobsen, 2013). Nevertheless, Christensen and Wright find that PSM increases the chance that the individual's subsequent jobs will be in the public sector. As the definition of PSM has expanded to take less consideration of classifying the boundaries of the public and private sectors, there has been a tendency that PSM no longer predicts the employment sector of individuals' job selection. However, PSM can be an indicator that shows whether individual public employees will maintain organizational membership and accept the organization's goals and values in a specific institutional setting.

Individual's beliefs, values, attitudes, and behaviors are influenced by reciprocal interaction between persons and their specific work environment (e.g., Chatman, 1989). As discussed earlier, PSM is characterized as individual beliefs, values, attitudes, and behaviors to do good for others, so that PSM can also be affected by individuals' interaction with their work environment. In other words, employees' continuous interaction with the work environment may increase sharing of some characteristics with

³ The three propositions are (1) "The greater an individual's public service motivation, the more likely the individual will seek membership in a public organization," (2) "In public organizations, public service motivation is positively related to individual performance," and (3) "Public organizations that attract members with high levels of public service motivation are likely to be less dependent on utilitarian incentives to manage individual performance effectively."

regard to PSM, and then their beliefs, values, attitudes, and behaviors are influenced by the shared norms and social institutions (Vandenabeele, 2007), whereas there could be conflicts between people and their environment if, for instance, individuals' values are not consistent with those of their work environment. In addition, insights from P-E fit suggest that better fit between people and environment results in beneficial outcomes such as higher job satisfaction, greater organizational commitment, and devoted organizational citizenship behavior (e.g., Chatman, 1991; Podsakoff et al., 2000).

Accordingly, continuous interaction enhances the level of P-E fit through the sharing of interests, values, abilities, and requirements between persons and their environment. For instance, a better P-O fit between person and organization can be represented as attracting job applicants with appropriate characteristics to an organization (Chatman, 1991; Kristof-Brown, 1996). The Attraction-Selection-Attrition model (Schneider, 1987) suggests that people are more likely to choose an organization in which they have greater perceived fit to the organization. Accordingly, PSM plays a role in increasing certain values and sharing the values and then is positively associated with P-O fit. Inversely, better P-O fit also may influence individuals' PSM. The following hypothesis is therefore proposed:

Hypothesis 1: The extent of individuals' public service motivation in an organization is generally positively associated with their degree of fit they perceive/report with their organization.

Individual Work Attitudes: Job Satisfaction and Organizational Commitment

Locke (1976, p. 1304) gives a comprehensive definition of job satisfaction as a "pleasurable or positive emotional state resulting from the appraisal of one's job or job

experiences.” Job satisfaction is a consequence of the employee’s perception of how well his or her job provides those things that he or she regards as important. According to Rainey (2009), a wide variety of elements are related to determining level of job satisfaction, including pay, promotion, job security, supervision, work-group characteristics, participation, and organizational structure and climate. Most researchers generally recognize that job satisfaction is a global concept comprising a variety of facets. Organizational commitment can be defined as “the strength of an individual’s identification with and involvement in a particular organization” (Porter et al., 1974, p. 604). It can be characterized by three dimensions: “(a) a strong belief in and acceptance of an organization’s goals and values; (b) a willingness to exert considerable effort on behalf of the organization; [and] (c) a definite desire to maintain organizational membership” (Porter et al., 1974, p. 604).

For work attitudes, the results of many empirical studies show that job satisfaction is positively correlated with motivation, job involvement, organizational citizenship behavior, organizational commitment, and job performance and negatively associated with turnover, absenteeism, and emotional exhaustion (Judge et al., 2001; Kreitner and Kinicki, 2001). Also, high organizational commitment seems to be associated with low absenteeism, turnover, and burnout rates as well as better performance (e.g., Park and Rainey, 2007; Porter et al., 1974). The PSM literature increasingly supports the idea that some individual work attitudes such as job satisfaction and organizational commitment are positively influenced by PSM (e.g., Homberg et al., 2015; Taylor, 2008), while some researchers question this positive relationship by arguing that PSM is negatively affected by the length of organizational membership (e.g., Moynihan and Pandey, 2007b). For

instance, Homberg and colleagues find a positive relationship between PSM and job satisfaction by using a meta-analysis based on 28 separate studies. In addition, according to the concept of P-E fit, individual employees' behavior and work attitudes are the result of continuous interaction between the person and the environment. Thus, for example, the enhancement of congruence between employees and organizations leads to positive outcomes for employee attitudes and behavior such as job satisfaction and organizational commitment (Bright, 2007; Kristof-Brown et al., 2005). In this section, I elaborate the relationships among PSM, P-O fit and work attitudes.

Public Service Motivation, Person-Organization Fit, and Job Satisfaction

With regard to PSM, a large body of research has supported a positive relationship between job satisfaction and PSM (e.g., Andersen and Kjeldsen, 2013; Moynihan and Pandey, 2007a; Naff and Crum, 1999), but there have also been either mixed or insignificant results (Bright, 2008; Taylor, 2007). In particular, a couple of studies found that job satisfaction was mediated by P-O fit, thus PSM has no significant relationship with job satisfaction when P-O fit is not considered (Bright, 2008; Wright and Pandey, 2008). Nevertheless, Homberg and colleagues (2015) have elucidated the uncertainty in the relationship between PSM and job satisfaction through a meta-analysis aggregating the effects of PSM on job satisfaction. They support the direct and strong positive relationship between PSM and job satisfaction. However, since they have conducted a meta-analysis focusing only on the direct relationship between PSM and job satisfaction and ignored the possible mediating effects of other factors, the relationship between job satisfaction of individual employees and PSM has not yet been fully identified.

In terms of the relationship between P-O fit and job satisfaction, for instance, Kristof-Brown and colleagues (2005) show evidence that P-O fit has a strong correlation with job satisfaction in their a meta-analysis with 65 separate studies. This finding supports that better P-O fit results in beneficial work outcome (i.e., increased job satisfaction). In the relevant PSM literature, several studies suggest that PSM is related to its outcomes by means of a mediated relationship of P-O fit rather than a direct relationship (e.g., Bright, 2008). In order to identify the unknown causal mechanism underlying the relationship between PSM and job satisfaction, P-O fit is considered as a mediator. The following hypotheses are therefore proposed:

Hypothesis 2: People with a high level of public service motivation in an organization are more likely to be satisfied with their job.

Hypothesis 3: Person-organization fit act as a mediator in the relationship between public service motivation and job satisfaction.

Public Service Motivation, Person-Organization Fit, and Organizational Commitment

Much of the PSM literature considers PSM to be an antecedent to organizational commitment (e.g., Crewson, 1997; Perry and Wise, 1990; Vandenberg, 2009). As is the case for job satisfaction, however, findings about the relationship between organizational commitment and PSM are mixed. Some studies found that PSM is positively related to organizational commitment (Crewson, 1997; Park and Rainey, 2007; Taylor, 2007), while others showed mixed or non-significant results or negative relationships between them (Leisink and Steijn, 2009; Ritz, 2009; Wright and Pandey, 2008). In addition, it has been argued that the relationship between PSM and organizational commitment works

the other way; that is, individual PSM is one of the consequences of organizational commitment (Camilleri, 2006).

With regard to P-O fit and PSM, the theory of P-O fit indicates that employees with a strong desire to deliver public service are more likely to be committed to their organizations (e.g., Bright, 2008). Therefore, perceived fit mechanisms between organization and individual values ultimately explain individuals' greater organizational commitment. Meta-analytic results support the positive relationship between them (Kristof-Brown et al., 2005). Meanwhile, a couple of studies point out that P-O fit is more directly associated with organizational commitment than PSM, thus it has been also claimed that the relationship between PSM and commitment is mediated by perceived P-O fit (e.g., Bright, 2007; Christensen and Wright, 2011). Accordingly, the extant theoretical and empirical work cannot explain fully the relationship between PSM and organizational commitment and the strength of the relationship. In order to clarify the mechanism which influences the relationship between PSM and organizational commitment, P-O fit is also adopted as a mediator, as posited in the following hypotheses:

Hypothesis 4: (a) People with a high level of public service motivation in an organization and (b) a better fit to the organization are more likely to show great organizational commitment.

Hypothesis 5: Person-organization fit act as a mediator in the relationship between public service motivation and organizational commitment.

Individual Performance

Public Service Motivation and Individual Performance

Since Perry and Wise (1990) suggested that PSM is positively associated with individual performance in public organizations, a large body of research relevant to PSM has been conducted to identify these relationships. In their meta-analysis, Warren and Chen (2013) provide support for a direct and positive relationship between PSM and performance. However, they point out that the mean effect size of the PSM-performance relationship is small enough to indicate that other factors may have more substantial impacts on performance. In addition, although a number of researchers have concluded that PSM has some kind of impacts on the extent of individual performance (e.g., Bright, 2007; Leisink and Steijn, 2009; Lewis and Frank, 2002; Naff and Crum, 1999; Vandenberghe, 2009), their findings have not conclusively shown whether an actual influence of PSM on performance exists (e.g., Alonso and Lewis, 2001; Brewer, 2010). Some scholars have even raised the possibility of reverse causality between PSM and performance (Wright and Grant, 2010). According to them, because of the limitation of cross-sectional survey research designs which cannot fully exclude alternative explanations for the empirical relationships between PSM and individual attitudes and behaviors, the causal direction that performance may enhance PSM should be also taken into consideration. Accordingly, this study proposes the existing argument that PSM positively influences individual outcomes as a model relationship and examines other relationships including a reverse causality model between PSM and performance, which is one of competing models. The following hypothesis is therefore proposed:

Hypothesis 6: Public service motivation is directly and positively related to individual performance.

Work Attitudes and Individual Performance

Job satisfaction refers to an individual's general work attitude, and a person with a high level of job satisfaction is expected to show a positive attitude toward his or her work. Accordingly, greater overall job satisfaction is positively associated with better performance (e.g., Edwards et al., 2008; Judge et al., 2001). This morale-productivity relationship has been supported in the attitudes literature in social psychology (e.g., Strauss, 1968). While many studies support this argument, some scholars question the effect size of the correlation between job satisfaction and performance (e.g., Iaffaldano and Muchinsky, 1985). Moreover, some researchers argue that better performance could lead to valued outcomes through which individuals are more satisfied with their jobs (e.g., MacKenzie et al., 1998) or job satisfaction and job performance have a reciprocal relationship (e.g., Sheridan and Slocum, 1975). The former (i.e., performance → satisfaction relationship) is founded in, for example, expectancy-based theories of motivation (e.g., Vroom, 1995) and self-determination theory (e.g., Deci and Ryan, 1985), while the latter (i.e., reciprocal relationship) has no distinct theoretical foundation. Hence, this study examines the reciprocal relationships between job satisfaction and performance to clarify the direction of their relationship. I propose:

Hypothesis 7: There is a reciprocal positive relationship between job satisfaction and individual performance.

Organizational commitment denotes an individual's attitude articulating the individual employee's identification with and attachment regarding his/her organization (e.g., Porter et al., 1974). While there has been discussion of several types of commitment such as normative, affective, and continuance commitment which differently affect behavioral outcomes in individuals (e.g., Porter et al., 1974), some research indicates a strong positive relationship between overall organizational commitment and individual job performance (e.g., Jaramillo et al., 2005; Park and Rainey, 2007). In particular, Jaramillo and colleagues identified a strong positive relationship by conducting a meta-analysis on studies across 14 countries in the private sector over the past two decades. Accordingly, we can assume a direct positive relationship between organizational commitment and individual performance. Researchers have shown that highly committed employees perform better than less committed ones (e.g., Mowday et al., 1974), and a significant positive relationship between commitment and individual performance has been found (e.g., Larson and Fukami, 1984; Riketta, 2002). The following hypothesis is therefore proposed:

Hypothesis 8: Organizational commitment is directly and positively related to individual performance.

Public Service Motivation, Person-Organization Fit, and Performance

The concept of P-O fit posits that value congruence between a person and his or her organization is associated with beneficial individual outcomes including individual job performance, because perceived greater P-O fit enhances communication, interpersonal interactions, and trust among work-group members which result in higher job performance and increased job satisfaction (e.g., Hoffman and Woehr, 2006; Kristof-

Brown, 1996). A meta-analysis for the relationship between P-O fit and performance shows evidence that P-O fit has correlations with overall job performance, task performance, and contextual performance although the magnitudes of correlations vary and are not big enough for their assumed effects (see Kristof-Brown et al., 2005, p. 311).

While the literature on PSM and P-O fit has indicated a direct positive relationship between individual performance and PSM and P-O fit, several studies have found mediating effects of P-O fit on the relationship between PSM and performance (e.g., Bright, 2007; Wright and Pandey, 2008). For instance, Bright found that PSM has no significant direct impact on individual performance when P-O fit is introduced as a mediator in the PSM-performance relationship. According to the theory of P-O fit, since individual employees are expected to perform better when they recognize a better fit in terms of values and goals between them and their organization (Kristof-Brown et al., 2005), P-O fit might be directly influenced by the extent of PSM which indirectly influences individual performance. A meta-analysis on the PSM-performance relationship points out that the effect size of its relationship is small enough to suggest that other predictors may have more considerable effects on performance (Warren and Chen, 2013). Therefore, I propose the following hypothesis:

Hypothesis 9: Person-organization fit act as a mediator in the relationship between public service motivation and individual performance.

Public Service Motivation, Work Attitudes, and Performance

Along with the impacts of PSM on public employees' behaviors and performance, certain work attitudes such as job satisfaction and organizational commitment have also received a lot of attention as factors influencing individual performance (Shore and

Martin, 1989). Many studies have shown evidence that PSM is positively associated with individual work attitudes (e.g., Bright, 2007; Naff and Crum, 1999; Park and Rainey, 2007) and positive work attitudes lead to better performance (e.g., Judge et al., 2001; Park and Rainey, 2007). However, Vandenberg (2009) challenged the direct relationship between PSM and individual performance and asserted the mediating effects of job satisfaction and organizational commitment on the PSM-performance relationship. His finding shows that job satisfaction and organizational commitment have partial mediation effects, which make it possible to assume that PSM could have a direct positive impact on job satisfaction and organizational commitment, and individual performance would be improved through increasing individuals' job satisfaction and organizational commitment, as posited in the following hypothesis:

Hypothesis 10: (a) Job satisfaction and (b) organizational commitment act as a mediator in the relationship between public service motivation and individual performance.

Meta-Regression Analysis

In this section, I examine the factors that potentially moderate the effects of PSM on individual performance by conducting a meta-regression analysis, including other relationships such as PSM-job satisfaction, PSM-organization commitment, PSM-PO-fit, job satisfaction-performance, organizational commitment-job satisfaction, and PO-fit-job satisfaction. The extant meta-analytic evidence suggests that geographical regions⁴ and

⁴ Geographical regions refer to the origin of the data set which indicates U.S.-based studies and non-U.S. studies. Warren and Chen (2013) suggested that the studies of the PSM-performance relationship using U.S. data show effect sizes lower than those conducted from non-U.S. data. Homberg and colleagues (2015) found that studies of the PSM-job satisfaction relationship using U.S. data produce weaker effects than those based on non-U.S. data.

publication status⁵ have moderating effects on the PSM-performance and PSM-job satisfaction relationships (Homberg et al., 2015; Warren and Chen, 2013). In order to examine the moderating effects of various factors on those relationships mentioned above, I used meta-analytic regression analyses by utilizing certain moderators such as publication status (i.e., peer-reviewed articles and unpublished studies), geographical regions (i.e., the U.S., Europe, and Asia), employment by job sectors (i.e., public, private, and mixed), analysis types (i.e., linear regression, structural equation modeling, and ANOVA), and sample size.

First of all, publication status is employed as a moderator because it is assumed that peer-reviewed journal articles may be of higher quality than unpublished studies (Lipsey and Wilson, 2001), which raises a hypothesis that, for instance, the average effect size of the PSM-performance relationship will be differently estimated by these different types of studies. The PSM research has been extended to various geographical settings around the world, including the U.S., Europe, and Asia. Consequently, it may be assumed that the studies examining PSM-relevant behaviors and outcomes in a certain region produce different effect size estimates from those in other regional settings because of the distinction of measurement instruments, perceived values associated with PSM, and perception regarding the dimension of PSM (Norris, 2003; Vandenabeele and Van de Walle, 2008). Vandenabeele and Van de Walle find that the overall PSM scores are influenced by geographical regions. For instance, European regions have lower overall PSM scores than American regions, and Asia falls somewhere between both regions.

⁵ Publication status indicates the distinction between published and unpublished studies. Warren and Chen (2013) suggested that the published studies on the PSM-performance relationship produce larger effects than the unpublished. Homberg and colleagues (2015) showed that the published studies of the PSM-job satisfaction relationship have stronger effects compared to the unpublished.

Even though the concept of PSM extends beyond the public sector, many studies reveal that public sector employees have a stronger service ethic than private sector employees (e.g., Rainey and Bozeman, 2000; Wittmer, 1991). That is, public sector employees are motivated by a strong aspiration to serve the public interest and society that is found less often among their private sector counterparts (e.g., Boyne, 2002; Houston, 2000; Perry and Wise, 1990). Accordingly, we could assume that PSM and the PSM-relevant attitudes of individuals are different between the public and private sectors. The studies associated with the current meta-analysis use several types of analysis, such as a linear regression, structural equation modeling, or ANOVA, to estimate the effects of the PSM-relevant relationships. Although we assume that those analysis types may show similar results in terms of the extent of effect size, it is interesting to see whether the effect size differs among the analysis types. Finally, the number of observations in a statistical sample can influence the estimate of the effect size. In particular, the correlations drawn from small sample sizes may be affected more significantly in a downward or upward direction rather than the larger. Therefore, this study examines the moderating effect of the sample size, though the estimated average effect size is already weighted by the sample size of each study.

A Rival Model Grounded in a One-Directional Relation

In a previous section, I identify two concepts of PSM and P-O fit. The former refers to individual beliefs, values, attitudes, and behaviors to do good for others and society, which could be influenced by their interaction with the work environment. On the other hand, the latter highlights the congruence regarding values and goals between individuals and their organizations, in which continuous interaction may improve P-O fit.

As a result, the extent of PSM and P-O fit would be affected by the state of individuals' interaction with their work environment, and they ultimately have a reciprocal and complementary relationship with each other. For instance, because the PSM-relevant relationship is mediated by the extent of supplementary and/or complementary fit between individuals and their organizations, sometimes an employee with high PSM may not produce better performance when he or she has a lower P-O fit perception (e.g., Bright, 2007). Along with this, we can assume that the relationship between P-O fit and outcomes is mediated by PSM, and thus even higher fit may yield lower outcomes when the employee has a low level of PSM in a public institutional setting. In other words, even though employees have a perfect congruence in terms of certain values, climates, and goals between themselves and their organization, they may have a different level of PSM and then produce a different level of performance. To assess and compare this assumption, I specify and test a competing model grounded in a one-directional relation in terms of the PSM-P-O fit relationship.

The competing model represents a typical and dominant perspective in the PSM literature and is depicted graphically in Figure 2.1, Panel B. This rival model is consistent with the propositions that, theoretically and empirically, not only should PSM be largely a determinant of work outcomes of employees, but also P-O fit serves as a mediator of the effects of PSM on certain work attitudes and individual performance (e.g., Perry and Wise, 1990; Bright, 2007, 2008). To date, in accordance with these propositions, most researchers argue that PSM directly influences a wide variety of work-related outcomes including P-O fit. Moreover, the scholars who suggest the role of P-O fit support the partial or full mediating effects of PSM on job satisfaction and performance.

Methods

Searching and Coding Studies

Successful completion of a rigorous meta-analysis starts with a thorough and intensive search of both the published and unpublished studies on the certain research question. As such, my literature search process for a meta-analysis follows a typical process of searching relevant electronic databases for keywords and citations and identifying reference lists. The literature search followed the suggestion by Warren and Chen (2013, p. 450) to include “academic electronic search engines, the proceedings of conferences” that may have focused on PSM, P-O fit, and outcomes (i.e., performance, job satisfaction, and organizational commitment), “government publication databases, working paper repositories, dissertation and thesis search engines, Google Scholar search, and contacts with authors engaged in PSM research.” The databases were searched using Boolean operations (such as AND, OR, parentheses, and quotation marks) and terms such as “public service motivation,” “PSM,” “person organization fit,” “P-O fit,” “performance,” “effectiveness,” “job satisfaction,” and “organizational commitment.” This search focuses on studies that were available as of June 2015 and written in English. I ended up searching almost every study on PSM. Nevertheless, of course, there may be some unpublished studies I have missed in other researchers’ file drawers, for instance, which never make it to a conference. The samples used represent authors from approximately 19 countries (7 in Asia, 11 in Europe, and the U.S.), which will help to ensure the generalizability of the findings. After identifying relevant studies for potential analysis, I assessed them on the basis of the following multiple criteria:

- (1) At least one independent variable within a study has to take a form of PSM, a dependent variable has to be at least performance, job satisfaction, or organizational commitment, and P-O fit has to be either a mediator or a dependent variable;
- (2) Studies found in the search process have to include either an observed or self-reported measure of PSM or a similar variant of PSM such as public service ethos;
- (3) Studies found have to present individual-level data on performance⁶; and
- (4) Studies found have to include effect size statistics (i.e., correlation coefficient) which were examined only for usable correlations between variables.

Conforming to the inclusion criteria enables us to thoroughly review available studies and to ensure that all appropriate studies are included. In addition, whether an included study was published in any journals and when the study was released were not included in the inclusion criteria, because the approach in the current paper can reduce publication bias and PSM is a relatively new research area. Multiple publications on the basis of the same sample were treated as independent studies only when they include and investigate different relationships, and separate samples in a single study were treated as independent. Two experienced researchers who possess a high degree of professionalism and have experience in conducting meta-analysis coded each study independently. With regard to reasonable coder reliability, this approach can easily resolve disagreements

⁶ There were seven studies examining the relationship between PSM and organizational-level performance. However, they were excluded from my SEM-based meta-analysis in order to run structural model analysis procedures, because the number of other paired relationships (e.g., PSM-PO fit, job satisfaction-organizational commitment) for a structural model analysis is too small to run the SEM-based meta-analysis.

through discussion, which leads to a consensus and minimizes inter-coder bias (Lipsey and Wilson, 2001). In total, 85 studies were collected from 28 different journals, 16 dissertations, and 13 other sources including conference proceedings and working papers, yielding 159 effects from 90 independent samples and representing a total of 452,565 observations. A list of the included studies is available on request.

Meta-Analysis Approach

The hypotheses in the current study derive from relationships between each variable discussed in previous sections. In general, the associations and covariations between variables are reported by the Pearson correlation coefficient (r). The correlation coefficient is an effect size measurement commonly used in a meta-analysis (Lipsey and Wilson, 2001). In fact, correlation coefficients are the most commonly reported statistics in eligible studies. In this paper, the five variables (i.e., PSM, P-O fit, performance, job satisfaction, and organizational commitment) are examined, and r seems to be an appropriate effect size statistic. In particular, for the computation of appropriate correlations, I follow Hunter and Schmidt⁷ (2004) by combining certain correlations including a set of relevant variables or dimensions to create a composite correlation between the sums of each item (or dimension) measuring a certain construct. For instance, when a certain study calculates correlations among four dimensions of PSM and individual performance, the PSM dimensions can be combined rather than averaged to

⁷ “If the k measures in the independent variable composite are $x_1, x_2, \dots, x_i, \dots, x_k$ and the $[m]$ measures in the dependent variable composite are $y_1, y_2, \dots, y_i, \dots, y_m$, then the correlation between the two composites when all variables are equally weighted is $r_{XY} = \frac{\mathbf{1}'R_{xy}\mathbf{1}}{\sqrt{\mathbf{1}'R_{xx}\mathbf{1}}\sqrt{\mathbf{1}'R_{yy}\mathbf{1}}}$,” = $\frac{Cov(X,Y)}{SD_X SD_Y}$ (Hunter and Schmidt, 2004, p. 437). Note that, for instance, $\mathbf{1}'R_{xy}\mathbf{1}$ is the sum of all the values in the intercorrelation matrix of the x_k and y_m measures, where R_{xy} is the correlation matrix among the x_k and y_m measures and the $\mathbf{1}$ s are vectors indicating values in R_{xy} are to be summed (Hunter and Schmidt, 2004, p. 435).

yield a more precise estimate of an overall value (Hunter and Schmidt, 2004). This approach to a composite correlation deals with those dimensions as a multi-item scale rather than four separate measures, which can enhance the reliability of measures (Nunnally and Bernstein, 1994). Accordingly, such an approach enables the study to provide a single overall correlation between PSM and performance, and thus offers a more accurate and precise indication in terms of the numbers of studies and observations used in this meta-analytic database.

Once the data were compiled, all calculations were performed using Comprehensive Meta-Analysis software (version 2) which is designed for running meta-analyses (Borenstein et al., 2009). It analyzes correlation coefficients using Fisher's *r*-to-*z* transformation, which is widely used and reasonably accurate (Fisher, 1921). This is because *r* is easy to calculate but does have the limitation that it "contains a very small downward bias as an estimate of the population parameter ρ , is bounded by $-1 \leq r \leq 1$, meaning that *r* is both truncated and censored, and its variance depends strongly on its value" (Ringquist, 2013, p. 109).

$$Z_r = 0.5 \ln [(1 + r) / (1 - r)]$$

with variance

$$V [Z_r] = 1 / (n - 3),$$

where *n* is the sample size. Then, Fisher's *z* correlations are converted back to correlations to present the overall mean for each pair of variables, as reported in Table 2.1 below.

$$r = (e^{2Z_r} - 1) / (e^{2Z_r} + 1)$$

Finally, this study used a random effects⁸ model because it is assumed that “each observed effect size differs from the population mean by subject-level sampling error plus a value that represents other sources of variability assumed to be randomly distributed” (Lipsey and Wilson, 2001, p. 119). In addition, in order to figure out the heterogeneous distribution of effect sizes, I use a Q statistic in which a significant Q means that “the variability across effect sizes is greater than expected from sampling error alone” (Lipsey and Wilson, 2001, p. 133).

Structural Model Analysis Procedures

The meta-analytic process provides a correlation matrix of study variables (see Appendix A). I used Mplus software (version 6.0), which is designed for structural equation modeling (SEM), with the correlations and harmonic means in Appendix A to test the proposed and rival models for the variables of PSM, P-O fit, performance, job satisfaction, and organizational commitment (see Figure 2.1). I used the harmonic means⁹ of the total sample size of the correlations as the sample size for the purpose of precise model estimation (Viswesvaran and Ones, 1995). The harmonic mean is less sensitive to a distant outlier than arithmetic means and thus provides a more conservative test of the model relationships. In order to make an allowance for measurement error in the model constructs, I set error terms for the variables equal to 1 minus the mean reliability values

⁸ Fixed and random effects models in meta-analysis are different from those in panel data analysis. While the fixed effects approach assumes that “each individual effect size Θ_i estimated from an original study is a single realization of a common population effect size Θ that is identical across all studies,” the random effects approach deals with the population effect size Θ as a normally distributed random variable rather than as a constant (Ringquist, 2013, pp. 118-120).

⁹ Harmonic mean refers to “the reciprocal of the arithmetic mean of the reciprocals of the items being averaged” (Ferguson, 1931, p. 36). The formula is $H = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_i}} = \frac{n}{\sum_{i=1}^n \frac{1}{x_i}}$, where n is the number of studies and x_1, x_2, \dots, x_i represent each sample size.

obtained in the meta-analysis (i.e., PSM, .76; P-O fit, 0.88; performance, .85; job satisfaction, .79; organizational commitment, .77). Finally, I tested mediation hypotheses by following the procedure Iacobucci and colleagues (2007) suggest to estimate mediation in SEM (see Appendix B).

Results

Meta-Analytic Results

Overall Results

The pairwise correlations for all available samples are indicated in Table 2.1. The first and second columns indicate the available relationship examined, and Cronbach's alpha reliability coefficients are provided in parentheses. The third and fourth columns provide the number of estimates obtained through the literature search and the corresponding total sample sizes in the original studies, respectively, included in the meta-analytic estimate. In the fifth column, the sample size weighted mean correlation is provided. The sixth column reveals the test statistic for the mean correlation, and the lower and upper bounds of the 95% confidence interval of the observed correlations are presented in the seventh column. In terms of the overall studies, these numbers range from a minimum of 1 estimate and 205 observations (for the correlation between P-O fit and performance) to a maximum of 68 estimates and 421,372 observations (for the correlation between PSM and job satisfaction).

Table 2.1 Meta-Analytic Results and Correlations for the Study Samples

Relationship		Number of Estimates	Total Sample Size	Mean <i>r</i>	<i>z</i> -value	95% Confidence Interval
Variable 1	Variable 2					
PSM (.76)	POF	8	3,244	.364	12.060**	.309 to .416
	JS	68	421,372	.234	8.610**	.182 to .285
	OC	36	78,915	.375	8.252**	.292 to .452
	PER	11	37,521	.189	6.029**	.128 to .248
	GEN	36	125,814	-.008	-.449	-.035 to .022
	AGE	43	128,175	.071	5.142**	.047 to .105
POF (.88)	JS	6	2,240	.579	8.073**	.462 to .676
	OC	1	814	.608	20.098**	.563 to .650
	PER	1	205	.377	5.636**	.253 to .489
	GEN	4	1,349	-.036	-.772	-.128 to .056
	AGE	3	1,041	.028	.888	-.033 to .088
JS (.79)	OC	18	62,115	.573	18.739**	.525 to .617
	PER	6	20,278	.370	5.757**	.251 to .479
	GEN	33	122,667	-.006	-.460	-.032 to .020
	AGE	38	123,927	.045	3.597**	.020 to .069
OC (.77)	PER	4	18,572	.370	6.786**	.270 to .463
	GEN	11	43,879	-.020	-2.139*	-.038 to -.002
	AGE	13	43,602	.062	1.839	-.004 to .127
PER (.85)	GEN	4	18,019	-.026	-.554	-.116 to .065
	AGE	4	18,019	-.031	-4.116**	-.045 to -.016

Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance; GEN = gender (female: 1; male: 0); AGE = age. Cronbach's alpha is provided in parentheses. Harmonic mean = 2,354. ** $p < .01$; * $p < .05$.

As shown in Table 2.1, PSM has moderate¹⁰ correlations with certain variables: .364 with P-O fit, .234 with job satisfaction, and .375 with organizational commitment. On the other hand, PSM has a relatively smaller correlation with individual performance (.189)¹¹ than the other factors. As Warren and Chen (2013) discussed, this result indicates that other factors may have more considerable impacts on performance.

¹⁰ Cohen (1988) has categorized the Pearson correlation for effect size as 0.1 (small), 0.3 (medium), and 0.5 (large).

¹¹ For reference, the correlation between PSM and organizational performance is .178 ($p < .01$), which is relatively smaller than the one in terms of individual performance (.189).

P-O fit has relatively strong correlations with work attitudes and a moderate correlation with performance although there were not enough studies to reach a definitive conclusion: .579 with job satisfaction, .608 with organizational commitment, and .377 with performance. In addition, job satisfaction has a strong correlation with organizational commitment (.573), and performance has moderate correlations with job satisfaction (.370) and organizational commitment (.370).

There are a variety of overall average effect sizes between the ten primary relationships with significant z scores. As already discussed, the average effect size of the PSM-performance relationship ($r = .189$) was less than those of the other three performance-related relationships: P-O fit-performance ($r = .377$), job satisfaction-performance ($r = .370$), and organizational commitment-performance ($r = .370$). In addition, PSM is most correlated with organizational commitment ($r = .375$) and P-O fit ($r = .364$). This seems to be because the critical characteristic of PSM (i.e., interactions with others) is quite related to the characteristics of commitment and fit.

Test of Homogeneity

After computing overall average effects, we need to know whether the effect sizes are consistent across studies by identifying the variation in the true effect sizes. The homogeneity of effect sizes obtained from the studies is tested using the Q statistic, which is distributed as a chi-square with $k - 1$ degrees of freedom (where k is the number of effect sizes, Borenstein et al., 2009). Under the random effects model, it is assumed that the true effect sizes may vary across studies. Accordingly, if the Q value is greater than its associated degree of freedom ($d.f.$), then the observed variability exceeds expectation, indicating that the distribution of effect sizes among populations is

heterogeneous. On the other hand, because of an issue that the Q statistic does not indicate the extent of heterogeneity and is influenced by the number of studies involved, Higgins and Thompson (2002) proposed using the I^2 statistic showing the proportion of variation in effect sizes which cannot be explained by sampling error.

Table 2.2 Test of Homogeneity

	Corrected Mean (r)	LL-UL (r)	$d.f.(Q)$	Q-value	$p(Q)$	I^2
PSM-POF	.364	.309 to .416	7	20.181	.005	65.314
PSM-JS	.234	.182 to .285	67	12546.034	.001	99.466
PSM-OC	.375	.292 to .452	35	5451.248	.001	99.358
PSM-PER	.189	.128 to .248	10	254.931	.001	96.077
POF-JS	.579	.462 to .676	5	64.584	.001	92.258
JS-OC	.573	.525 to .617	17	992.304	.001	98.287
JS-PER	.370	.251 to .479	5	273.055	.001	98.169
OC-PER	.370	.270 to .463	3	99.486	.001	96.984

Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance; Corrected Mean (r) = weighted correlation; LL-UL = lower and upper limits of the 95% confidence interval; $d.f.$ = degree of freedom; Q = homogeneity stats; I^2 = amount of variation in effect size that cannot be explained by sampling error.

Table 2.2 presents that the distributions of effect sizes are significantly different from zero ($p < .05$), indicating they are heterogeneous across studies. For instance, in terms of the PSM-performance relationship, the value of ($Q - d.f.$) equals $244.931 > 0$, indicating that the Q value is greater than $d.f.$, thus this distribution of effect sizes is heterogeneous. In addition, the value of I^2 (96%) indicates that there is pretty high heterogeneity across studies according to Higgins and colleagues' (2003) scales¹². In general, researchers determine whether to operate a meta-analysis in a fixed effects or random effects model based on the result of a homogeneity test. In the public management and policy field, however, a random effects model is certainly preferred,

¹² According to Higgins and colleagues (2003), the values of I^2 in terms of heterogeneity among studies could be categorized as 25% (low), 50% (moderate), and 75% (high).

regardless of the homogeneous distribution of effect sizes, because of the variation in characteristics across the studies used in a meta-analysis (Ringquist, 2013).

Test of the Moderator Analyses: Meta-Regressions

I conducted meta-regressions in order to test the moderation hypotheses (see Table 2.3). The PSM-related effect sizes (i.e., PSM-PER, PSM-POF, PSM-JS, and PSM-OC) and the job satisfaction-related effect sizes (JS-PER, JS-OC, and JS-POF) are different from study to study by publication status (peer-reviewed articles or unpublished studies), geographical regions (the U.S., Europe, and Asia), employment (public, private, and mixed sectors), analysis types (linear regression, SEM, and ANOVA), and sample size.

The results for the moderation hypotheses reveal some interesting findings. For the PSM-performance relationship (Model 1), publication status ($\beta = .143, p < .1$) and geographical regions (the U.S.: $\beta = -.464, p < .01$; Europe: $\beta = -.225, p < .05$) moderate the influence of PSM on individual performance. In particular, the studies using the U.S. and European samples provide lower effect sizes than those using Asian samples, and peer-reviewed studies display larger effects of PSM on performance. Except for the effect sizes of the PSM-performance relationship, we cannot say there are differences between peer-reviewed articles and unpublished studies with regard to other effect sizes examined (Model 3 to 7). In addition, for the relationships between PSM-job satisfaction (Model 3, the U.S.: $\beta = -.142, p < .05$; Europe: $\beta = -.192, p < .01$) and PSM-organizational commitment (Model 4, the U.S.: $\beta = -.101, p > .1$; Europe: $\beta = -.161, p < .05$), the studies using the U.S. and European samples produce lower effect sizes than those using Asian samples. Overall, the studies from Asian regions produce much larger effects of

PSM on work attitudes and behaviors than non-Asian regions. In terms of analysis types, the studies using SEM analysis produce larger effects ($\beta = .135, p < .01$) of PSM on job satisfaction (Model 3) than those using linear regression analysis. Last, but most interesting, the studies using public sector samples show smaller effects of PSM on job satisfaction (Model 3, $\beta = -.0507$) and organizational commitment (Model 4, $\beta = -.0776$) than those using the private sector samples, even though the regression coefficients are not statistically significant.

Table 2.3 Meta Regression Results

Variable	(1) PSM-PER	(2) PSM-POF	(3) PSM-JS	(4) PSM-OC	(5) JS-PER	(6) JS-OC	(7) JS-POF
Publication	0.143* (0.0733)	-	0.0318 (0.0356)	0.0548 (0.0566)	-0.232 (0.0913)	0.0186 (0.0668)	-0.0874 (0.329)
Europe	-0.225** (0.0733)	-0.0314* (0.0110)	-0.192*** (0.0539)	-0.161** (0.0744)	0.284 (0.162)	0.0170 (0.0699)	-
U.S.	-0.464*** (0.0317)	0.149 (0.0809)	-0.142** (0.0548)	-0.101 (0.0683)	0.0509 (0.130)	-0.0893 (0.0832)	0.115 (0.334)
Mixed	-	-	-0.310*** (0.0769)	-	-	-	-
Public	-	-	-0.0507 (0.0395)	-0.0776 (0.0988)	-	-0.0643 (0.101)	-
SEM	-	0.0650 (0.0507)	0.135*** (0.0433)	0.0674 (0.0577)	-	0.0301 (0.0727)	0.103 (0.186)
ANOVA	-	-	0.0461 (0.110)	-0.0368 (0.0962)	-	-	-
Sample Size	-	0.0758 (0.0567)	0.0271* (0.0153)	0.0368 (0.0247)	-0.0900 (0.0676)	0.0414** (0.0172)	-0.0113 (0.204)
Constant	0.381*** (0.0733)	-0.197 (0.335)	0.142 (0.117)	0.231 (0.158)	1.082 (0.481)	0.324* (0.175)	0.609 (0.886)
Observations	11	8	68	36	6	18	6
R-squared	0.822	0.744	0.347	0.325	0.831	0.469	0.544

Note: Publication (peer-reviewed: 1; nonpublished: 0); Asia is a reference category in the geographical regions; Private sector is a reference category in the employment; Linear regression is a reference category in the analysis types. Robust standard errors in parentheses. *** $p < .01$, ** $p < .05$, * $p < .1$.

Test for Publication Bias

If the studies involved in a meta-analysis are a biased sample of all applicable studies, the overall average effects calculated by the meta-analysis will also be influenced by this bias (Borenstein et al., 2009). Therefore, a meta-analysis is not complete until we test for publication bias. By doing so, we can recognize whether some studies might be missing from our sample of relevant studies because of “rejection by editors of journal articles that produce results running counter to those expected by the field or the decision by authors to not submit articles for publication if their results conflict with expectation” (Warren and Chen, 2013, p. 461). In general, testing for publication bias includes identifying the distribution of effect sizes around the mean (e.g., using funnel plots); thus, if there is no bias, we may assume that there is a symmetric distribution around the mean (Warren and Chen, 2013). There are several ways to test for publication bias, including Begg and Egger’s regression tests for capturing an asymmetrical distribution of effect sizes and the Fail-safe N analysis for examining the extent of error. In this paper, I employed Egger’s regression test and the Fail-safe N analysis that builds on Rosenthal’s idea.¹³

Table 2.4 shows the number of observed studies in the meta-analysis and the number of missing studies that would make the p -value greater than alpha ($\alpha = .05$, nonsignificant p -value), assuming average effect sizes in the missing studies equal zero. Rosenthal (1979) argues that if the missing number is big enough then the results of the

¹³ “Assuming that a meta-analysis of m effect size is able to reject the null hypothesis that the average (or population) effect size [θ] is zero, *how many effect sizes of zero would need to exist in the unpublished literature to reverse the conclusions from this hypothesis test?*” (Ringquist, 2013, p. 253). That is, the Fail-safe N approach calculates the number of additional studies whose effect sizes are zero that are needed to increase the overall p -value for the meta-analysis to above .05.

meta-analysis would be reliable and there may be very low bias, suggesting a formula of $N = 5k + 10$ (k = the number of studies). In the case of the PSM-performance relationship, for instance, 65 ($= 5 \times 11 + 10$) studies would be needed to negate the computed average effect sizes, but the fail-safe N is 2,318, indicating it seems highly unlikely that this number of missing studies exist and were left out from the current study. Similarly, all of the other Fail-safe N values are greater than the number of needed missing studies. Therefore, there is little possibility of publication bias.

Table 2.4 Fail-safe N (the number of missing studies) Test for Publication Bias

	PSM- PER	PSM- POF	PSM-JS	PSM-OC	JS-PER	JS-OC	JS-POF	OC-PER
Observed Studies	11	8	68	36	6	18	6	4
Classic fail-safe N	2,318	880	56,701	80,688	3,840	82,220	1,261	2,636

Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance. The fail-safe N represents the number of effect sizes where the average effect size is equal to zero at the 5% significance level.

On the other hand, because the Fail-safe N analysis approach has some limitations¹⁴ (see Borenstein et al., 2009, p. 285), Egger's regression test has been recommended. This test quantifies the bias captured by the funnel plot by regressing the standard normal deviate (or standard normal variable) on precision (Ringquist, 2013). Accordingly, the intercept in Egger's test provides an estimate of the asymmetry of a funnel plot (i.e., positive values indicate a high level of test accuracy) and corresponds to the slope in weighted regression of the effect estimate on its standard error (Egger et al.

¹⁴ The Rosenthal's Fail-safe N approach has been called into question by several reasons: (1) there are no statistical criteria in terms of an interpretation of the Fail-safe N . It focuses on statistical significance rather than substantive significance; (2) there could be a variety of formulas estimating the number of missing studies; and (3) this approach focuses on significance tests combining p -values study to study. However, a recent common approach suggests computing a summary effect and its p -value (Borenstein et al., 2009).

1997). Thus, if the intercept differs from zero, then there is evidence for publication bias. Table 2.5 presents the intercept, standard error, and *p*-value in terms of each correlation. Except the intercept of the PSM-job satisfaction relationship (- 6.960, *p* <.001), the results indicate no signs of publication bias. Even though the result reported in the Fail-safe *N* analysis with regard to the PSM-job satisfaction relationship seems to support no publication bias, the Egger test results suggest the possibility of publication bias.

Table 2.5 Egger Test for Publication Bias

	PSM- PER	PSM- POF	PSM- JS	PSM- OC	JS- PER	JS- OC	JS- POF	OC- PER
Intercept	0.308	1.363	-6.960	-4.070	-6.956	-4.621	-2.601	-7.970
S.E.	2.489	2.202	1.786	3.177	4.383	2.546	4.499	3.132
<i>p</i> -value	0.904	0.559	0.001	0.209	0.188	0.088	0.594	0.126
<i>d.f.</i>	9	6	66	34	4	16	4	2

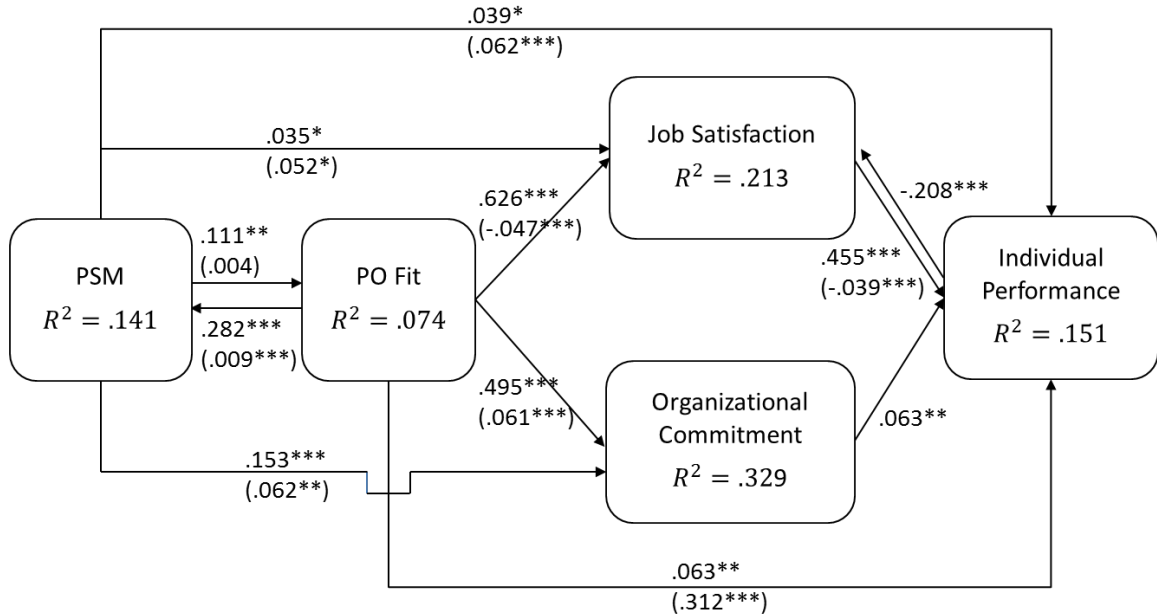
Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance. The *p*-value test is conducted at the 5% significance level.

Test Results for Structural Relationships

Test of the Proposed Model: Overall Model Fit

The proposed meta-analytic structural model (Figure 2.2; partial mediation model) provides a good fit to the data ($\chi^2 = 92.988$, *d.f.* = 5, *p* < .01; root mean square error of approximation (RMSEA) = .086 (*p* < .01); comparative fit index (CFI) = .973; standardized root mean squared residual (SRMR) = .039). Compared to this model, the full moderation model offers no significantly different fit to the data ($\chi^2 = 96.936$, *d.f.* = 6, *p* < .01; CFI = .972; SRMR = .04). However, the chi-square difference test ($\Delta \chi^2 = 3.948$, $\Delta df = 1$, and *p* = .047) indicates that at the 5% significance level, the difference in chi-square values for the comparison is statistically significant, and I chose the partial mediation model. Figure 2.2 presents a graphical representation of this meta-analytic

structural equation model which involves standardized direct and indirect effects and R^2 -squared values in terms of each construct.



Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance. All parameter estimates shown are standardized. Best-fitting partial model fit (depicted in Figure 2.2): $\chi^2 = 92.988$ ($d.f. = 5, p < .01$), RMSEA = .086 ($p < .01$), CFI = .973, SRMR = .039, AIC = 43559.460; Fit statistics (full mediation model): $\chi^2 = 96.936$ ($d.f. = 6, p < .01$), RMSEA = .080 ($p < .01$), CFI = .972, SRMR = .040, AIC = 43561.409. *** $p < .01$, ** $p < .05$, * $p < .1$. Entries in parentheses are the indirect effects.

Figure 2.2 Structural Path Estimates for the Proposed Model

Test of direct effect relationship

The test of the structural relationships supports a majority of the direct effect-related hypotheses. Table 2.6 provides the standardized structural coefficients and t -statistics on the basis of all available direct correlations. For the sake of convenience, all structural coefficients are referred to as betas (β). As proposed in H1, PSM and P-O fit have reciprocal relationships; that is, they significantly affect each other. Specifically, PSM has small and direct positive effects on P-O fit ($\beta = .111, t = 2.462$), and P-O fit has moderate and positive effects on PSM ($\beta = .282, t = 6.733$). Furthermore, PSM has less

impact than small but positive significant effects on job satisfaction (H2, $\beta = .035$, $t = 1.779$) and small and positive effects on organizational commitment (H4a, $\beta = .153$, $t = 8.491$). P-O fit has large and positive effects on job satisfaction ($\beta = .626$, $t = 28.434$) and organizational commitment ($\beta = .495$, $t = 31.874$), supporting H4b. In particular, as proposed in H6 through H8, PSM ($\beta = .036$, $t = 1.867$), P-O fit ($\beta = .063$, $t = 2.257$), job satisfaction ($\beta = .455$, $t = 11.277$), and organizational commitment ($\beta = .063$, $t = 2.256$) have positive significant effects on individual performance. Among them, job satisfaction has the largest effect on performance. On the other hand, the result from the data shows a negative impact of performance on job satisfaction; therefore, H8 is not supported.

Table 2.6 Estimates of Structural Relationships for the Best-Fitting Proposed Model

Main Hypothesis and Effect	Standardized Direct Effect / <i>t</i> -statistic
H1. PSM → P-O fit	.111 / 2.462 **
Total effect:	.115 / 2.410 **
P-O fit → PSM	.282 / 6.733 ***
Total effect:	.291 / 7.063 ***
H2a. PSM → Job Satisfaction	.035 / 1.779 *
Total effect:	.088 / 2.682 ***
H2b. P-O fit → Job Satisfaction	.626 / 28.434 ***
Total effect:	.579 / 35.252 ***
H4a. PSM → Organizational Commitment	.153 / 8.491 ***
Total effect:	.215 / 7.134 ***
H4b. P-O fit → Organizational Commitment	.495 / 31.874 ***
Total effect:	.555 / 40.189 ***
H6. PSM → Performance	.039 / 1.867 *
Total effect:	.101 / 3.773 ***
H7. P-O fit → Performance	.063 / 2.257 **
Total effect:	.374 / 20.232 ***
H8. Job Satisfaction → Performance	.455 / 11.277 ***
Total effect:	.415 / 14.056 ***
Performance → Job Satisfaction	-.208 / -7.055 ***
H9. Organizational commitment → Performance	.063 / 2.256 **

Note: Entries separated by slashes are standardized direct effect on the left and *t*-statistics on the right. When there are no mediating variables, direct effects equal total effects. *** $p < .01$, ** $p < .05$, * $p < .1$.

Mediation hypotheses

As discussed in a previous section, for the PSM-relevant relationships, Bright (2007) and Wright and Pandey (2008) suggested mediating effects of P-O fit, and Vandenberg (2009) found mediating effects of job satisfaction and organizational commitment. Consistent with these arguments, H3, H5, H9, H10a, and H10b propose that P-O fit mediates PSM's effects on individual's work attitudes (i.e., job satisfaction and organizational commitment) and performance, and work attitudes mediate PSM's effects on individual performance. The results are presented in Table 2.7, Panel A, which provide strong support for these expectations. In other words, the P-O fit and work attitude variables play a role in the mediation process. More specifically, the ratios of PSM's indirect to total effects on job satisfaction and organizational commitment are 59% and 29% respectively, indicating that the intervening variable (i.e., P-O fit) accounts for each percentage of PSM's effects on work attitudes. Furthermore, the ratios of PSM and P-O fit's indirect to total effects on individual performance are 61% and 83% respectively, suggesting that these moderators explain these portions of PSM's effects on performance.

Table 2.7 Estimates of Mediation Analyses

A. Proposed Competing Model (PSM has a feedback effect on P-O fit)				
Relationship	Total Effect	Direct Effect	Ratio (Indirect/Total)	Significant Mediation
PSM-JS	.088	.035	59%	Partial*
PSM-OC	.215	.153	29%	Partial**
PSM-PER	.101	.039	61%	Partial***
POF-JS	.579	.626	-8%	Partial***
POF-OC	.555	.495	11%	Partial***
POF-PER	.374	.063	83%	Partial***

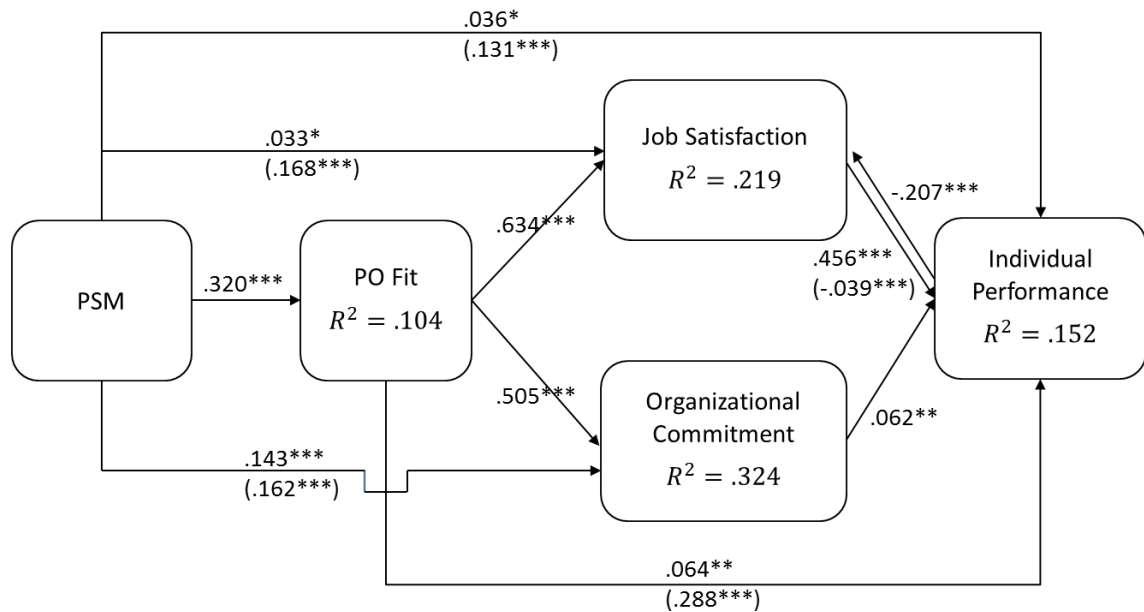
B. Competing Model (PSM improves P-O fit)				
Relationship	Total Effect	Direct Effect	Ratio (Indirect/Total)	Significant Mediation
PSM-JS	.201	.033	84%	Partial***
PSM-OC	.304	.143	53%	Partial***
PSM-PER	.167	.036	78%	Partial***
POF-PER	.351	.064	82%	Partial***

Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance. *** $p < .01$, ** $p < .05$, * $p < .1$.

Test of the Rival Model

With respect to the effect of PSM on performance, the proposed competing model (Figure 2.1, Panel B; i.e., P-O fit is influenced by PSM) of full mediation (i.e., no direct relationship between PSM and performance) provides no significant different fit to the data ($\chi^2 = 167.370$, $d.f. = 7$, $p < .01$; RMSEA = .099, $p < .01$; CFI = .951; SRMR = .061) in comparison to the final competing model (Figure 2.3). However, adding the direct relationship between PSM and performance (i.e., partial mediator model) very slightly improves model fit to the data ($\Delta \chi^2 = 3.948$, $\Delta df = 1$, and $p = .047$), though the improvement is not substantial; that is, the results also present that the effects of PSM on performance are partially mediated by P-O fit and work attitudes. Specifically, the ratios of PSM’s indirect to total effects on job satisfaction (84%), organizational commitment

(53%), and performance (78%) as well as of P-O fit's indirect to total effects on performance (82%) are greater than those in the best-fitting proposed model (see Table 2.7), because the mediation effects of PSM were excluded from the proposed model (Figure 2.2). While the average ratio of the indirect to total effects for the competing model (74%) is substantially greater than that for the proposed model (26%), the proposed model has a better fit to the data ($\Delta \chi^2 = 70.434$, $\Delta df = 1$, and $p < .01$). In addition, the proposed model provides a better understanding of the relationship between PSM and P-O fit to identify and elaborate on structural relationships among the variables.



Note: PSM = public service motivation; POF = person-organization fit; JS = job satisfaction; OC = organizational commitment; PER = performance. All parameter estimates shown are standardized. Model fit: $\chi^2 = 163.422$ ($df = 6$, $p < .01$), RMSEA = $.106$ ($p < .01$), CFI = $.952$, SRMR = $.060$, AIC = 43627.894 . $***p < .01$, $**p < .05$, $*p < .1$. Entries in parentheses are the indirect effects.

Figure 2.3 Structural Path Estimates for the Competing Model

Discussion

Theoretical Implications

Perry and Wise (1990) emphasized and summarized the presumable behavior implications of PSM, and a number of researchers have explored and examined their propositions. To date, however, it is very hard to fully understand the relationships between PSM and other factors; that is, the causal mechanism between PSM and its outcomes has not been fully specified. Stimulated by that research and those results, this study elaborates on the relationships between PSM and its outcomes (i.e., performance, job satisfaction, and organizational commitment) and the role of P-O fit by using structural analyses of meta-analytic correlations. This research represents an important first step toward learning and understanding these complicated relationships. Specifically, this study conceptualizes a reciprocal relationship between PSM and P-O fit to identify direct and indirect effects of PSM on individual outcomes. Many studies have raised the possibility that the PSM-relevant relationships are mediated by other factors (e.g., Bright, 2007; Wright and Pandey, 2008; Vandenberg, 2009), and there is an intimate connection between PSM and work environment including P-O fit and interactions (e.g., Chatman, 1991; Ryu, 2014). This conceptualization helps us bridge different results among extant studies.

In accordance with this new conceptualization and the extant arguments, the findings of this meta-analytic structural equation analysis indicate that PSM and P-O fit have a feedback effect and that P-O fit and work attitudes represent part of the mediation mechanism through which P-O fit and work attitudes affect individual outcomes. That is, PSM enhances the extent of congruence between individual employees and their work

environment (e.g., P-O fit), and then this better fit reinforces an individual's PSM. In particular, PSM helps individuals select and continue at certain organizations delivering public services (e.g., Vandenberg, 2008), which leads to a high level of congruence between them and their work environment (Cable and Judge, 1996). Consequently, their continuous interactions could increase certain values and beliefs involved in the PSM dimensions (e.g., Taylor, 2008). It is important to note that this conceptualization of the reciprocal relationship enables us to better understand how PSM differently influences individual outcomes.

The findings that P-O fit mediates the effects of PSM on work attitudes and individual performance support the idea that PSM could have no significant direct effect on individual performance (e.g., Bright, 2007) and job satisfaction (e.g., Bright, 2008; Wright and Pandey, 2008) when the value congruence between individual employees and their organizations is not considered. In addition, the finding of the mediating role of work attitudes also supports the idea that work attitudes (i.e., job satisfaction and organizational commitment) have partial or full mediating effects on the PSM-performance relationship (Vandenberg, 2009). This line of reasoning provides insights to a large body of literature that shows only direct effects of PSM or mixed results in terms of the PSM-relevant relationships because it represents the appropriate way to understand how PSM influences individual outcomes. This study demonstrates that PSM enhances individual work attitudes and performance through effects largely mediated by P-O fit, job satisfaction, and organizational commitment. This finding underscores that promoting congruence between individuals and their work environment and improving their work attitudes may be as important as hiring employees with high PSM.

As some researchers pointed out the possibility of reverse causality between PSM and performance (e.g., Wright and Grant, 2010), further research should examine whether there is reverse causation by using appropriate time lags. For meta-analytic data, there is a way to test reverse causality (see Orlitzky et al., 2003). Unfortunately, however, the data used in this meta-analytic structural analysis are cross-sectional, which means that there are no time lags in the data. Nevertheless, I preliminarily tested another competing model (i.e., individual performance enhances individual PSM) to see if there is a possibility of reverse causality, even though the test results cannot demonstrate the exact directional association. The results presented in Appendix C show that performance has trivial but direct effects on PSM ($\beta = .053, t = 2.219$). In addition, individual performance has small and positive effects on job satisfaction ($\beta = .154, t = 8.523$) and organizational commitment ($\beta = .133, t = 7.538$) and moderate effects on P-O fit ($\beta = .356, t = 17.169$). However, this competing model provides a relatively inferior fit to the data compared to the proposed model ($\chi^2 = 172.362, RMSEA = .108, CFI = .950, SRMR = .060$). The chi-square difference test ($\Delta \chi^2 = 79.274, \Delta df = 1, \text{ and } p < .01$) indicates that the proposed model with more freely estimated parameters fits the data better than this new competing model.

This study adds to the growing body of literature offering support for the nature and incidence of the PSM theoretical framework. Although inconsistent empirical evidence has contributed to the rise of theoretical skepticism about PSM's influence on key work outcomes, the findings of this study support our expectation that these inconsistent findings are due to the impacts of various and different model specifications including different measures and unaccounted-for moderation. For instance, while the

average effect size of the PSM-performance relationship is $r = .189$, Vandenberg (2009) found a correlation coefficient between PSM and performance of $r = .253$ but Brewer and Selden (1998) found $r = .03$. Although they used comparable models, the studies arrived at different conclusions because Vandenberg investigates PSM's effects on self-reported performance whereas Brewer and Selden investigate its effects on an individual's most recent appraisal rating assigned by the individual's supervisor.

Lastly, but most fundamentally, there are a couple of implications of this meta-analytic study. One is that we can confirm the fact that the positive and direct associations between PSM and work outcomes such as P-O fit, work attitudes, and individual performance exist across studies. However, each average effect size of those relationships is described as relatively small (i.e., PSM-performance and PSM-job satisfaction) and moderate (i.e., PSM-organizational commitment and P-O fit) in contrast to our expectations. Since many aspects in terms of congruence of values and organizational commitment appear to be significantly associated with characteristics of PSM, the overall effect sizes for PSM and both factors are larger than those for PSM and the other factors (i.e., job satisfaction and performance) whose ratios of PSM's indirect to total effects are greater than the ratios regarding the former factors.

The other implication is the results of moderator analyses. Consistent with the findings of the extant meta-analyses (i.e., Homberg et al., 2015; Warren and Chen, 2013), the findings in this study show that peer-reviewed studies provide significantly larger effects of PSM on performance ($p < .1$), but produce insignificant effects of PSM on job satisfaction. In addition, the result found shows that the average effect sizes of the PSM-organizational commitment relationship are not much different between published and

unpublished studies. Furthermore, in comparison with research using Asian samples, studies using U.S. and European samples show significant and negative signs in terms of PSM-relevant relationships (except the PSM-organizational commitment relationship using the U.S. samples). These differences could result from different understandings and interpretations of PSM's concept and measures (e.g., Kim et al., 2013).

Implications for Practitioners

As Brewer (2010) correctly pointed out, the relationship between PSM and performance remains a main concern of public management scholarship and practice. This concern has been extended to include work attitudes and congruence of values between employees and their work environment in the public management field. The findings of this research offer a key suggestion to managers and practitioners in the public sector. This study finds that PSM positively influences job satisfaction, organizational commitment, and individual performance. In addition, the results show a reciprocal relationship between PSM and P-O fit, which implies that both help to foster positive relationships each other. Moreover, the study indicates that the effects of PSM happen through various factors such as P-O fit and work attitudes. In other words, certain portions of the effects of PSM on performance may be indirectly accomplished by enhancing the matching values of employees and employers (or organizations) and achieving a working environment conducive to job satisfaction and organizational commitment. Consistent with this conclusion, managers and practitioners are recommended to take account of PSM as a criterion for employee recruitment, hiring, retention, and compensation and benefit procedures.

Limitations and Further Research

Despite its contributions, this study has a couple of limitations that need to be discussed. Foremost of these is that, as is common in any meta-analytic work, a meta-analysis may be constrained by the research questions researchers choose to examine, the limited description of research settings they use, and the methodological quality of the original articles (Hunter and Schmidt, 2004; Lipsey and Wilson, 2001). For example, fewer publications consider mediation effects in the PSM theoretical framework and use panel data or time-series design to establish validity. In addition, most studies in the meta-analysis have the possibility of common method bias by which there could be spurious relationships between the explanatory and response variables. Therefore, this study was limited to investigating the effects of correlations that were available in the original studies, and there are some concerns about whether the original studies in this study may be biased due to the methodological issues.

As mentioned above, in order to address the causality issue between variables, we need to test for possible reverse causality. Generally, cross-sectional survey research designs have limited internal validity. That is, the results from survey data make it impossible to fully rule out alternative explanations for the empirical relationship between PSM and individuals' attitudes and behaviors (Wright and Grant, 2010). In other words, there could be reverse causality between PSM and performance and other work attitudes, which cannot be ruled out due to the use of a cross-sectional research design. Unfortunately, most studies included in this analysis utilize cross-sectional data. Due to these data limitations, it was not possible to examine reverse causality by using time-lagged relations. Instead, a test of competing explanation was conducted by comparing fit

to the data. With regard to the issue of common method bias, some researchers have already pointed out that studies using all common raters generally report higher effect sizes than those using partial or no common raters (e.g., Kristof-Brown et al., 2005; Meier and O'Toole, 2013; Petrovsky and Ritz, 2014). Unfortunately, all studies in the meta-analysis measure explanatory and response variables with respondents' self-reported perceived measurement. Accordingly, care is needed in interpreting the results found in the paper because it could not examine the difference between perceived and objective measurement due to data limitations. Therefore, further research should use data collected at different points in time (e.g., Westover and Taylor, 2010) or by randomized and controlled experiments (e.g., Bellé, 2013) to establish a causal relationship and strengthen the external validity.

For PSM research, fewer publications consider certain factors (e.g., organizational citizenship behavior, job stress, or burnout) as predictable variables affecting work outcomes and PSM, other than job satisfaction and organizational commitment. As pointed out by Wright and Grant (2010), there could be some factors that influence PSM and other responsible variables, which may create a spurious relationship between the explanatory and response variables. In order to enhance robustness in a meta-analysis, we can test for omitted-variable bias by using substantive factors that are correlated with PSM, which could be causally associated with outcome variables including performance. Wright and Grant suggested the personality trait of conscientiousness and supervisors' cognitive biases as omitted variables. Due to data limitations, however, this study could not conduct a robustness analysis.

Even less extant research focuses on the distinction between individual and organizational performance. Because the dimensions of individual and organizational performance are not the same, we anticipate different effects of PSM on either individual or organizational performance (Brewer, 2010). Moreover, due to the small number of studies that featured degree of freedom, it is impossible to test various variables when conducting a meta-regression analysis. In particular, since this study uses only one estimate with regard to each relationship between P-O fit and organizational commitment as well as P-O fit and performance, there is the possibility of misinterpreting these associations. Therefore, future researchers should include potential omitted variables in their studies to strengthen internal validity and investigate the moderating role of interesting factors including common control variables such as gender, age, education and so on, as well as a separation between individual and group or organizational performance to provide a stronger basis for empirical generalizations about the effects.

Concluding Remarks

This study contributes to the increasing body of literature on PSM-relevant relationships as a foundation for further research endeavors. The results found from 90 independent samples indicate that PSM positively influences work outcomes including value congruence between employees and their organizations. In particular, PSM has stronger relationships with P-O fit and organizational commitment than job satisfaction and individual performance. These influences of PSM on performance seem to be mediated by various work attitudes and degree of matching fit, and to be stronger in the work environment in which employees' and their organizations' values and goals are similar or employees' characteristics bridge a gap in their organizations. Moreover, the

effect of PSM on performance seems to be greater when employees are satisfied with their job and have a high level of organizational commitment. Therefore, the results of this study underline the merits of PSM as a criterion for attraction-selection-attrition processes.

Chapter Three

Bridging the Gap: Social Networks as a Theoretical Mechanism Linking Public Service Motivation and Performance

Introduction

A body of theory and systematic evidence links Public Service Motivation (PSM) to a range of individual and organizational outcomes including job satisfaction and organizational commitment as well as individual and organizational performance. The focus of the extant literature has been on studying PSM and its antecedents and consequences as an individual characteristic. For instance, public employees with high levels of PSM are predicted to have strong organizational commitment. However, this perspective has two shortcomings. First, even individuals with high PSM are sometimes dissatisfied with their jobs, show low levels of organizational commitment, or do not accomplish much. The extant research does not thoroughly explain these situations. Only a few researchers have tried to elaborate on these situations by using, for example, the concept of person-organization (P-O) fit (e.g., Bright, 2007; Wright and Pandey, 2008). According to them, PSM influences individual performance and job satisfaction via increases in congruence between the individual and the public organization, assuming a positive relationship between PSM and P-O fit; however, this perspective is still based on an individual characteristic such that interactions among individuals have not been considered. Second, the causal mechanism between PSM and group outcomes has not been fully specified. For instance, although meta-analytic results support the existence of direct and positive relationships between PSM and performance (Warren and Chen, 2013) and job satisfaction (Homberg et al., 2015), several studies identify the mediating

effects of job satisfaction and organizational commitment (Vandenabeele, 2009) as well as P-O fit (Bright, 2007; Wright and Pandey, 2008) on the relationship between PSM and individual outcomes. Moreover, a meta-analytical structural equation analysis with regard to the relationships among PSM, individual work attitudes, and individual performance supports the finding that PSM is mediated by other factors in the previous chapter of this dissertation. While these efforts do partially address the PSM-related linkage as an individual characteristic, little is known about the mechanism linking PSM and individual- and group-level outcomes in which interactions of individuals are critical processes. In particular, the causal mechanism between PSM and group-level outcomes has not been fully addressed in prior research. At most, some mechanisms linking PSM with organizational performance have been briefly discussed (e.g., Brewer and Selden, 2000; Kim, 2005; Petrovsky and Ritz, 2014; Ritz, 2009).

Accordingly, the purpose of this paper is to develop a framework by using the concept of social networks among work group members, in which networks of relationships between the members play a key role in providing the mechanism linking employees' PSM with individual- and group-level performance. Furthermore, this paper suggests several propositions to empirically test the mechanism. Because this approach draws on social network perspectives including the concept of social capital, the following discussion related to PSM goes beyond an individual perspective. In sum, this article proposes avenues for future empirical research by suggesting new conceptual linkages and propositions with regard to PSM.

For this argument, I elaborate on a couple of concepts related to a social network perspective. Social networks refer to the social interactions and personal relationships

among members of groups (Kadushin, 2012). Two types of social network relations are relevant in my framework to understand the relationships with performance: *advice network relations* represent positive exchange relations through which members may share information and guidance related to the completion of their work, whereas *adversarial network relations* refer to negative exchange relations that result in “interference, threats, sabotage, and rejection” as well as affective feelings that come from such behaviors (Sparrowe et al., 2001, p. 318). For instance, it is expected that work group members within networks of advice relations not only perform better individually and jointly under certain circumstances but also reinforce each member’s PSM by enhancing relationship quality. In general, PSM represents an individual’s predisposition to engage in prosocial behavior (e.g., Houston, 2008), including but not limited to “social trust, social altruism, equality, tolerance, humanitarianism, and civic participation,” which are core components of social capital (Brewer, 2003, 5). Social capital built by PSM exists in the relations among persons. Furthermore, individuals are embedded in social networks, such as a network of advice relations, through which social capital is generated (Brass, 2012; Lin, 1999). Consequently, their beliefs, values, attitudes, and behaviors might be influenced by the networks and the social capital embedded in the networks. In sum, PSM and social networks act in a reciprocal fashion through the medium of social capital. I derive several propositions from this theoretical framework.

To this end, I begin by looking at PSM in brief and reviewing the literature on the mechanism between PSM and performance. I then discuss social capital and social networks including networks of advice and adversarial relations. With these foundations, I develop a theoretical framework for empirically analyzing the relationships between

PSM and performance and suggest a most suitable research design to test those empirically testable propositions. Finally, I discuss specific implications, limitations, and future research directions to test the propositions.

Previous Literature on Public Service Motivation

The Concept of Public Service Motivation

PSM has attracted a lot of attention in studies of the effectiveness of public institutions (Perry et al., 2010), and some scholars have made efforts to elaborate the concept from different perspectives. Vandenaabeele (2007, p. 547) encompasses various definitions of PSM as “the belief[s], values, and attitudes that go beyond self-interest and organizational interest, that concern the interest of a large political entity, and that motivate individuals to act accordingly whenever appropriate.” A common denominator of the definitions is that PSM denotes an internal motivation to do good for others and society (Perry et al., 2010). PSM extends beyond public institutional settings because it is an individual characteristic found in employees delivering public services that could be provided by various types of organizations such as public, private, and hybrid organizations (e.g., Brewer and Selden, 1998; Perry and Hondeghem, 2008b). In addition to this, the features of interaction PSM brings about should be considered when describing PSM because individual motivations might be continuously and reciprocally affected by relationships with other group members (e.g., Zhou et al., 2009). For the purpose of this paper emphasizing the concept of networks, PSM can be described as the values and attitudes of an individual who delivers public services through internal and external interactions with others and who goes beyond self-interest and organizational interest, with the purpose and the willingness to do good for others and society.

Extant PSM-outcomes Mechanism and Limitations

Consequences of PSM have received widespread attention in public management. Many researchers have suggested that PSM is an antecedent of organizational commitment (Crewson, 1997; Naff and Crum, 1999; Park and Rainey, 2007), and job satisfaction has been found to be a consequence of PSM in the public sector environment (Bright, 2008; Kim, 2005; Naff and Crum, 1999). Along with the effects of PSM on public employees' attitude, behavior, and attainments, job satisfaction and organizational commitment have received a lot of attention with regard to their influence on employees' performance (Shore and Martin, 1989). In this section, I briefly elaborate on these relationships and focus on the PSM and performance relationship in the following sections to clarify this relationship by using a different perspective. I expect the other linkages to be further discussed in future research.

Since Perry and Wise (1990) suggested that PSM is positively associated with individual performance in public organizations, a large body of literature relevant to PSM has been focusing on these relationships. Whereas some researchers have found convincing evidence of a relationship between PSM and performance (e.g., Brewer and Selden, 1998; Kim, 2005; Ritz, 2009), others have found mixed results and raised some doubts (e.g., Alonso and Lewis, 2001). Nonetheless, these results have been challenged because of the possibility of common source (method) bias by which spurious results can occur due to biases in individuals' perceptions of performance (e.g., Meier and O'Toole, 2013; Petrovsky and Ritz, 2014). Furthermore, several studies have found mediating effects of P-O fit (Bright, 2007) and job satisfaction and organizational commitment (Vandenabeele, 2009) on the relationship between PSM and performance. These findings

indicate that extant studies have not yet fully explained the causal mechanism between PSM and performance; instead, they have partially explained it based on a static aspect of PSM.

In terms of job satisfaction and organizational commitment, the results of some empirical studies show that job satisfaction is positively correlated with motivation, job involvement, organizational citizenship behavior, organizational commitment, and job performance (Judge et al., 2001; Kreitner and Kinicki, 2001). Also, high organizational commitment seems to be associated with low absenteeism, turnover, and burnout rates as well as better performance (e.g., Park and Rainey, 2007; Porter et al., 1974). With regard to PSM, some research supports a positive relationship between job satisfaction and PSM (Moynihan and Pandey, 2007b; Naff and Crum, 1999), but there have also been either mixed or insignificant results (Bright, 2008; Taylor, 2007). In particular, a couple of studies found that job satisfaction was mediated by P-O fit, thus PSM has no significant relationship with job satisfaction when P-O fit is not considered (Bright, 2008; Wright and Pandey, 2008). In addition, some literature considers PSM to be an antecedent to organizational commitment (e.g., Perry and Wise, 1990; Vandenabeele, 2009), and the theory of P-O fit indicates that employees with a strong desire for delivery of public service are more likely to be committed to their organizations (e.g., Bright, 2008). Consequently, the extant theoretical and empirical work cannot fully explain the relationship between PSM and job satisfaction and organizational commitment.

There could be a few reasons why the extant empirical results do not fully account for the PSM relevant relationships (e.g., PSM-performance relationship). First, the concept of PSM involves a wide variety of different dimensions and can be differently

understood in each culture or country (Kim et al., 2013; Vandenabeele and Van de Walle, 2008), thus the development of a measure of PSM is an issue that remains to be solved (Vandenabeele et al., 2014). Because there is no single universal scale of PSM, there could be conflicting empirical findings on the PSM-outcomes relationship. In the previous chapter of this dissertation, for example, the meta-regression results show that each relationship associated with PSM has different effect sizes across regions. Second, the phenomenon of public and private sector blurring in terms of public service delivery can also lead to complex structures in the relationship. Therefore, it is very hard to fully understand the relationship of PSM with other variables. Finally, but most important of all, the causal mechanism between PSM and outcomes has not been specified fully. For instance, two meta-analytic studies provide support for direct and positive relationships between PSM and performance (Warren and Chen, 2013) and job satisfaction (Homberg et al., 2015). However, in contrast with the strong effect of the PSM-job satisfaction relationship, the mean effect size of the PSM-performance relationship is small enough to indicate that other factors could have more considerable impacts on performance (Warren and Chen, 2013). In addition, several studies identify the mediating effects of job satisfaction and organizational commitment (Vandenabeele, 2009) and P-O fit (Bright, 2007; Wright and Pandey, 2008) on the relationship between PSM and individual outcomes. The existence of a mediator variable may account for a different causal mechanism. In the previous chapter of this dissertation, a meta-analytical structural equation analysis with regard to the relationships among PSM, value congruence, individual work attitudes, and individual performance supports the finding that PSM is mediated by various other factors, indicating that there are different causal mediating

processes. These results indicate the complexity of PSM-relevant relationships and require us to show specific theories as a guide to research and illustrate explicit conceptual mechanisms, which are developed in the following sections.

Social Network Perspective

Social Capital and Public Employees

Social capital has become a preeminent concept in social science. Generally, social capital is thought of as benefits that result from relationships with others. In particular, two perspectives can be identified with regard to its definition. One perspective focuses on individuals and how they access and control resources embedded in social networks to gain benefits (Lin, 1999), emphasizing that individuals' positions in a network provide benefits to them (Brass, 2012). The other perspective focuses on the group (collective) and how groups of members collectively develop and maintain relationships to provide benefits to the group members as well as the group (Lin, 1999); that is, the interest of this perspective is how norms, trust, and sanctions as social capital are produced and maintained in a network of relationships (Coleman, 1990). Putnam's (1993, p. 167) empirical work is another example of this perspective, and he defines social capital as "features of [a] social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions." Trust is a necessary value in order to develop relationships, and it is assumed that an individual member is doing some good things because he or she trusts that his or her actions may be rewarded through positive relationship development. Social norms are based on generalized reciprocity, and social capital is embedded in norms. Putnam also asserted that social networks indicate voluntary cooperation or networks of civic engagement.

The extent of social capital is identified by individuals' positions and quality of relationships within a network (Coleman, 1990; Lin, 1999; Paarlberg and Varda, 2009). For the positions of individuals, for instance, whether individuals can reach one another through direct or indirect connections is one of the key elements to assess the level of social capital. The connectivity and strength of connections indicate how easily or difficultly individuals within a network access and use social resources (Lin, 1999). With regard to the quality of relationships, on the other hand, for instance, trust can affect the extent of social capital by promoting the relations and enhancing the utility of resources (Coleman, 1990; Paarlberg and Varda, 2009). As trust increases, members in a network are willing to share embedded resources and maintain their relationships regardless of the risk of exchange relationships (Lin, 1999; Paarlberg and Varda, 2009). Some scholars compare public servants and other citizens in terms of critical civic attitudes and prosocial behaviors associated with social capital at the group (collective) level, including social trust, social altruism, equality, tolerance, humanitarianism, and civic participation (Brewer, 2003) as well as prosocial behaviors and civic participation (Houston, 2008).¹⁵ They found that public employees are not only more civic minded (i.e., trustworthy, altruistic, supportive of equality, tolerant, and humanitarian) and more active in civic engagement in public affairs than other citizens, but also act as catalysts to create social capital (Brewer, 2003); public employees with high PSM tend to engage more frequently in prosocial acts and possess more empathetic and altruistic attitudes than non-public

¹⁵ *Social trust* refers to “the foundation of moral behavior on which social capital is built [and] is correlated with civic norms and civic participation ... linked with civic culture, political participation, and trust in government;” *social altruism* includes “thinking and acting in helping ways;” *humanitarianism* represents “a sense of responsibility for other people’s well-being and needs;” and *civic participation* refers to “civic engagement...in their communities” (Brewer, 2003, pp. 10-11); *prosocial behavior* refers to “actions directed toward another individual (or individuals) that are defined by society as generally beneficial to the target of the action” (Dovidio et al. (2006), quoted in Houston (2008), p. 182).

service employees (Houston, 2008). Furthermore, according to social network literature (e.g., Mehra et al., 2001), individual characteristics and one's motivation can affect network structures (i.e., individual perspective for social capital). For instance, Mehra and colleagues found that high self-monitors tend to possess high-betweenness centrality (i.e., indicator of an individual's centrality in a network). According to social cognitive theory, we can expect that individuals with high levels of PSM may occupy positions of centrality because they have stronger self-regulation power (Perry and Vandenberg, 2008).

Social Networks

Social capital theorists posit that social capital is embedded in a network of social relationships. Networks have been studied in a wide variety of academic domains, and thus the concept of networks has been differently understood and analyzed depending on each discipline (Brass, 2012). Nevertheless, all networks have two essential elements: nodes and ties. Brass (2012, p. 668) defines a network as “a set of nodes and the set of ties representing some relationship or absence of relationship between nodes.” In the case of social networks, the nodes represent actors and ties refer to connections or relationships among the actors. Social networks have two major characteristics: “homophily,” which means that those who have identical characteristics tend to be connected to each other, and “influence,” which refers to a situation in which those who are connected tend to have an effect on one another (e.g., Fiore et al., 1983; Kadushin, 2012). In other words, individuals in a network can be connected with others based upon their similarities of position or attributes and exchange social relations including cognitive relations, interactions, or flows of information (e.g., Brass, 2012). With regard

to PSM, employees who have similar attributes (e.g., high levels of PSM) might interact with one another and affect network structure (e.g., Mehra et al., 2001) and the types of relationships in the workplace (e.g., Zhou et al., 2009). In sum, through a social network, the actors exchange and share their resources such as information and guidance related to the completion of their work.

Network research can be broadly classified into two perspectives: structural and behavioral. From a social structural point of view, an individual's position in a network could be an important predictor to calculate outcomes such as performance, beliefs, and attitudes because his or her position can determine fully or in part the constraints and opportunities the individual will face (Borgatti et al., 2013; Brass, 2012). In this case, group- or organizational-level networks can be treated as a unit of analysis, and a key research question would be, "What is the effect of social network structure on outcomes?" On the other hand, a managerial networking perspective or a network behavior view focuses on the individual as a unit of analysis and tends to investigate how an individual's beliefs, attitudes, and activities affect and constitute a network (e.g., Rhodes, 2002; Walker et al., 2010).

The managerial perspective provides an insightful view to see the content and quality of the relationships by assigning values to connection (Brass, 2012; Granovetter, 1973). Morgan and Hunt (1994) assert that the quality of relationships can be assessed by the levels of relationship commitment¹⁶ and trust, which are components of social capital and enable actors in a certain network to work at maintaining relationship investments by

¹⁶ Relationship commitment is defined as "an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it; that is, the committed party believes the relationship is worth working on to ensure that it endures indefinitely" (Morgan and Hunt, 1994, p. 23).

cooperating/collaborating with other actors and to favor expected long-term benefits, rather than short-term ones, by interacting with existing partners in the belief that other actors will not engage in opportunistic behavior. Thus, I identify the PSM-network link from both structural and managerial perspectives.

Networks of Advice and Adversarial Relations

Although a body of research on social networks has focused on positive relationships, negative relationships have recently drawn research attention because negative connections are sometimes more powerful predictors of outcomes than positive relationships (Labianca and Brass, 2006). Consequently, there are broadly two types of network relations¹⁷ in the context of social networks in work group or organizations: *advice network relations* refer to positive exchange relations through which network members share resources such as information, guidance, and assistance related to the completion of their work, whereas *adversarial network relations*¹⁸ represent negative

¹⁷ Baldwin and colleagues (1997) suggest three types of relationships: friendship, communication, and adversarial relationships. Friendship networks considerably overlap with communication networks in terms of social support and trust network perspectives, and both would be indicative of advice relationships. Meanwhile, there can also be friendships that involve little advice, e.g. between people within different parts of an organization who enjoy each other's company but cannot provide much useful advice to each other. Klein and colleagues (2004) also employed the three types of networks and found that the first two types overlap. Sparrowe and colleagues (2001) suggest two types of networks: advice and hindrance networks. In the present article, I use the terms "advice network" and "adversarial network" because these are more broadly known in the management field.

¹⁸ With regard to networks of adversarial relations, we can discuss the concept of dark networks in which networks are considered problems (Raab and Milward, 2003) as well as the "dark side of managerial networks" such as the politically powerful elements that affect a public manager's behavior "magnifying the tendency toward inequality already present in the social setting" (O'Toole and Meier, 2004a, p. 681). According to Raab and Milward (2003, p. 413), the dark networks approach aims to evaluate "how network structures and governance are used for criminal or immoral ends." That is, this approach focuses on illegal or illicit activities such as terrorism, or drug or arms trafficking. On the other hand, O'Toole and Meier argue that the political elements of networks and networking (i.e., network management) should be considered in order to calculate more accurately how networks affect organizational behavior and performance. Both concepts of dark networks and the dark side of managing networks can in part explain the phenomenon of corrupt public employees with high PSM. However, because both concepts are complicated and multidisciplinary approaches, the present paper focuses on a context aspect of networks rather than a content aspect.

exchange relations that lead to such behaviors as interference, threats, sabotage, and rejection and affective responses including emotional upset and annoyance among members (Pagel et al., 1987; Sparrowe et al., 2001). Social networks could be a cause of stress or support. For instance, positive social support derived from positive exchange relations (i.e., advice network relations) such as providing information, guidance, advice, warmth, friendship, and assistance can relieve life stress (Fiore et al., 1983). Presumably, stress might lead to negative outcomes while support might have positive effects on outcomes. Therefore, it is very important to assess social network types in order to identify more precisely the relationship between PSM and its outcomes.

A growing body of literature on networks in the public management field has been focusing on positive aspects of networks. The exceptions includes studies by Korac-Boisvert and Kouzmin (1994) and Raab and Milward (2003), who investigated illegal or irregular aspects of social networks such as networked learning between prisoners, terrorism, and arms trafficking, and O'Toole and Meier (2004a), who examined the political aspect of networks in terms of managerial networking in school districts and suggested that managers are pressured to respond to the most influential actors in a network. These studies were focused on the contents of networks, which are developed within a given network relation and can affect and constitute the network.

Intuitively, we can imagine negative aspects of a network of adversarial relations. What happens to individual- and group-level performance if an individual has an uneasy and strained relationship with other members in work-related networks? Those outcomes might be negatively associated with social relationships when they occur within a network of adversarial relations. Labianca and colleagues (1998) and Labianca and Brass

(2006) paid attention to the role of negative relationships in the context of social networks and proposed that negative relationships have greater power to explain group-level work outcomes than positive relationships because real-world negative relations have more significant effects on the workplace. This argument is supported by empirical findings that a network of negative relations is negatively related to an individual's attitudes, behavior, and outcomes (Baldwin et al., 1997; Sparrowe et al., 2001).

Theoretical Background and Propositions

PSM is described in the present paper as the values, desires, and attitudes of an individual who delivers public services through internal and external interaction with others beyond self-interest and organizational interest, with the purpose and willingness to do good for others and society. As elaborated earlier, high PSM enables individuals to enact prosocial behavior including social trust, social altruism, and civic engagement (e.g., Brewer, 2003; Houston, 2008), and then through individual attributes enhancing the trust and norms of reciprocity (e.g., self-regulation), individuals with high PSM may become central in a network (Mehra et al., 2001). Meanwhile, Putnam (2001) suggests five general dimensions¹⁹ of social capital: community organizational life, engagement in public affairs, community volunteerism, informal sociability, and social trust. Of these dimensions, engagement in public affairs, community volunteerism, and social trust are strongly related to the dimensions of PSM (i.e., attraction to policy making, commitment to the public interest, compassion, and self-sacrifice), thus PSM is also affected by social

¹⁹ “*Community organizational life* reflects the formal organizational resources available within local communities ... *engagement in public affairs* is ... participation in democratic politics through voting in elections and attendance at public meetings ... *community volunteerism* ... [is] voluntary individual acts of assistance and participation in community projects ... *informal sociability* reflects the social life people enjoy in settings that are not formally organized ... *social trust* refers to the underlying generalized reciprocity that guides exchanges between community members” (Andrews, 2011, pp. 51-52).

capital due to their similar nature. As shown in Figure 3.1, PSM and social capital have a feedback effect by which social capital will reinforce an individual's PSM, and social capital embedded in and affected by a network may, for example, positively influence a network feature of advice relations through social support and information exchange.

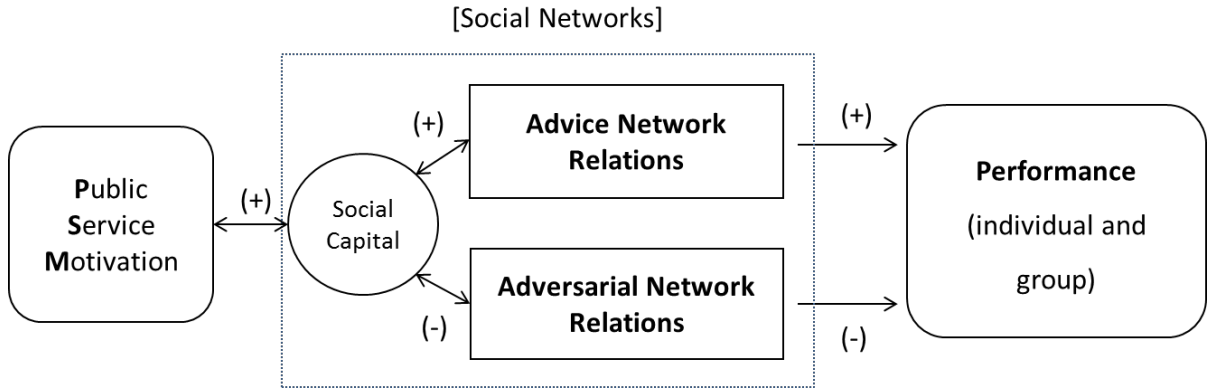


Figure 3.1 Social Networks in a PSM-Performance Mechanism

As mentioned before, social capital has structural and behavioral aspects; the former is realized by an individual's position within networks and the latter refers to the norms and values affecting members in networks (Andrews, 2011). Variations in networks (or network features) could increase or decrease the quantity or quality of social capital captured from embedded resources in social networks because certain elements (i.e., information flow, influence levels, and personal identification) affecting social capital vary depending on the social networks, or vice versa (Lin, 1999). These structural and behavioral aspects are intertwined in networks, each affecting the other (Brass, 2012). Theoretically, drawing on a network perspective, individual- and group-level performance might be affected by how to access and use the embedded resources in social relations such as task advice and information (i.e., structural aspects) and how to

enhance the quality of relationships through trust and mutual recognition (norms; i.e., behavioral aspects). In this article, the propositions are developed based on the structural aspects on account of two reasons. First, this approach can clarify the linkage among PSM, social network, and performance by reducing the feedback effects between PSM and social networks including social capital. Second, it can be assumed that trust and relational norms (i.e., behavioral aspect) may enhance effective exchange relationships among individuals and ultimately encourage beneficial performance (e.g., Aulakh et al., 1996; Colquitt et al., 2007).

For future empirical testing, my propositions are presented first at the individual-level and then at the group-level. At the individual level, in order to identify the relationship between an individual's network position within a work group and individual performance, one of the structural properties of social networks is employed, namely centrality (Inkpen and Tsang, 2005; Sparrowe et al., 2001). Centrality refers to the extent to which an individual has a central position in a network (Brass, 2012) and is often used to predict outcomes for certain individuals in a network (Borgatti et al., 2013). For positive relations, for instance, central individuals tend to have more opportunities to obtain resources such as work-relevant information and guidance and to influence others due to their numerous relationships with others (Borgatti et al., 2013). In contrast, central individuals in networks of negative relations may have more constraints to access and share valuable resources because others presumably have negative feelings and behavior intentions toward the focal person, which might lead to negative effects on attitudes and behaviors. Moreover, the extant research on centrality elaborates on the relationships between centrality and power (e.g., Brass and Burkhardt, 1993) and innovation (e.g.,

Ibarra, 1993). In addition, in terms of personality, high self-monitors tend to become central in groups (e.g., Mehra et al., 2001).

At the group level, however, a different structural property of an interaction pattern (i.e., density) is employed in order to capture the overall level of connection within a group network of relations rather than the level of an individual's connections (Sparrowe et al., 2001). Density refers to the number of connections in a network of relations and can be expressed as a proportion of the number possible in the network (Borgatti et al., 2013). In other words, the more connections through which each group member interacts with other group members, the greater the density within a group network. Accordingly, other things being equal, for instance, the greater density in a network of positive relationships indicates that there may be much more social support and effective transmission of resources within the network (Kadushin, 2012). Coleman (1990) noted that in a densely connected network, members provide each other with trust, reciprocal norms, and monitoring behavior as well as sanctions against inappropriate behavior. Thus, individuals in a densely connected group, especially when they are in a network of positive and strong relationship, may be more motivated to provide reciprocal exchange of information, benefitting group performance (Kadushin, 2012).

Public Service Motivation and Individual-Level Performance (see Figure 3.2)

The attitudes and behaviors of individuals with higher PSM are expected to be positively related to building beneficial social capital and central positions in a network. A network of advice relations consists of positive relationships through which the individuals share resources such as information, support, and guidance that are positively associated with individual outcomes. For instance, when a public employee solves

problems and completes his or her work by using task-relevant information available from other work group members, this positive relationship becomes an important means for accessing resources that enhance individual performance. Thus, a central individual in a network of advice relations may benefit due to easy access to reliable information. Centrality in a network of positive relationships represents “an individual’s involvement in exchanging assistance with coworkers and engaging in mutual problem solving” (Sparrowe et al., 2001, 318). Therefore, central individuals in a network of relationships may have more connections from which they are able to gain resources because a large number of connections in the network involve the central individuals (Borgatti et al., 2013). Baldwin and colleagues (1997) found a positive relationship between the centrality in a network of team members and their grades (i.e., effectiveness). In contrast, individuals who are in peripheral positions in positive network relations may have much more difficulty finding task-relevant solutions that enable them to achieve high levels of performance. Therefore, even though individuals have a high level of PSM, they may not yield higher achievement when they are not central in work groups in which there are positive network relations.

Proposition 1: (a) An individual employee’s PSM will have an indirect positive effect on his or her performance through the individual’s position in a network of positive relations (i.e., a mediator effect). (b) Each relation in the mediation model is conditional on the level of advice network relations (i.e., a moderator effect).

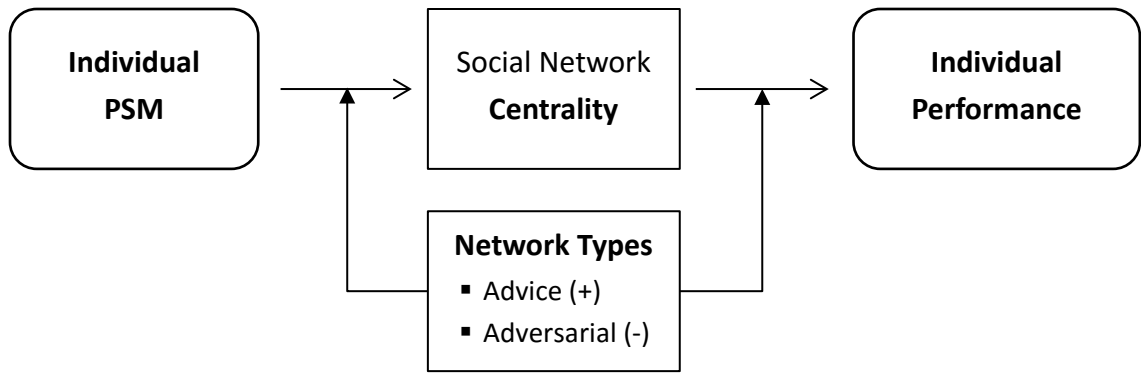


Figure 3.2 Conceptual Model for Individual-level Performance

On the other hand, social networks affected by negative exchange relations (i.e., networks of adversarial relations) could yield constraints such as interference, rejection, and emotional upset among members, which negatively affect individual outcomes (Brass, 2012; Labianca and Brass, 2006; Sparrowe et al., 2001). Centrality in a network of adversarial relations indicates “the extent to which coworkers described a focal individual as a person who makes it difficult for them to complete their work by withholding valuable information, resources, and opportunities” (Sparrowe et al., 2001, p. 318). The extent of PSM should not be expected to change the network types themselves but only affect the levels of negative relationships to be mitigated. Thus, when individuals are central in a network of negative relationships, they may not produce better performance although they have higher PSM.

Proposition 2: (a) An individual employee’s PSM will have no significant effect on his or her performance when the individual’s position in a network of negative relations is considered (i.e., a mediator effect). (b) Each relation in the mediation model is conditional on the level of adversarial network relations (i.e., a moderator effect).

Public Service Motivation and Group Performance (see Figure 3.3)

The logic behind the PSM and individual performance linkage can be extended to the relationship between PSM and group performance. That is, for instance, social capital built by the high levels of PSM each group member has makes the individual members densely connected, so they may be motivated to exchange resources under certain circumstances of increasing trust, reciprocal norms, and social sanction. Baldwin and colleagues (1997) found that positive relationships between teams have positive effects on the team grade. From this finding, we can expect that when certain group members have positive exchange relationships with a large portion of other group members (i.e., dense networks of advice relations), the group has a high likelihood of successful completion of its tasks because the group may benefit from greater information sharing, greater cooperation, greater reciprocal interdependence, and less conflict, all of which lead to enhanced group performance (Balkundi and Harrison, 2006; Labianca et al., 1998; Sparrowe et al., 2001). Thus, a work group that contains individuals with high PSM is expected to enhance group performance via a dense group network of positive relationships.

Proposition 3: (a) Group-level PSM will have an indirect positive effect on group performance through the density of group members in a network of positive relations (i.e., a mediator effect). (b) Each relation in the mediation model is conditional on the level of advice network relations (i.e., a moderator effect)

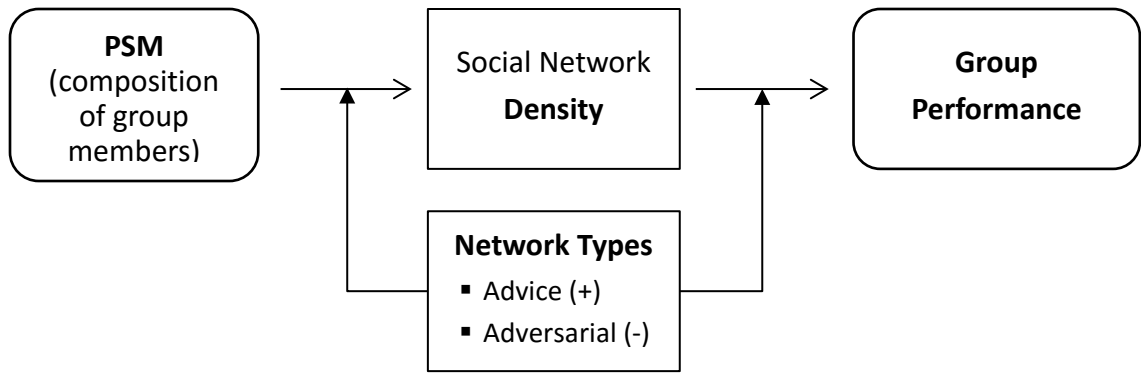


Figure 3.3 Conceptual Model for Group-level Performance

On the other hand, group-level performance may get worse if certain individual group members have negative relationships with a large portion of other group members who hinder information flow, show significantly less cooperation, and express hostile feelings and attitude (Sparrowe et al., 2001), even though third parties can affect the extent of negative relationships between other members expansively or reductively (Kelley and Thibaut, 1978). Compared to the effect size of a group member's central position in adversarial network relations on individual performance, the impact of isolated members on group performance may be relatively small because a higher dense network can defuse negative relationships (Labianca and Brass, 2006). However, as the number of such members increases or such relations continue for a longer period, the dense negative relationships can significantly affect group performance (Sparrowe et al., 2001). Therefore, a work group in which a large portion of coworkers are in a dense group network of negative relationships cannot achieve better group performance even if the coworkers have high PSM.

Proposition 4: (a) Group-level PSM will have no significant effect on group performance when the density of group members in a network of negative relations is considered (i.e., a mediator effect). (b) Each relation in the mediation model is conditional on the level of adversarial network relations (i.e., a moderator effect)

Suggestions for Research Design

In this section, I suggest a relatively common but suitable research design based on a survey method to evaluate my testable propositions, emphasizing three parts: data collection, measurement, and an analytical framework.

The best option for collecting data would be to construct a panel data set (i.e., repeated survey at regular intervals of time) for at least one interval of time. This approach enables us to identify how respondents change both connections and behavior and the ways both could be interrelated. In particular, it is recommended to collect a complete data set which includes information about all of the participants involved in a study. Accordingly, it would be preferable to employ a whole-network research design which enables us to use all network concepts and techniques (Borgatti et al., 2013) and thus to investigate organizational- and individual-level phenomena. For instance, we might study who has positive or negative relationships with whom among all members of a given department or agency at each level of government, given that several complete work groups of respondents are involved in that department or agency. A whole-network design requires a high response rate (at least 80%) to ensure valid and reliable network analysis (Wasserman and Faust, 1994). When confidentiality with regard to respondents becomes an issue and research questions do not necessarily need a whole-network

approach, personal-network (or ego-network) research designs may have an advantage over whole-network designs (Borgatti et al., 2013). Of course, the data set has to include valid and reliable measures in terms of PSM, network density and centrality, types of networks (i.e., advice and adversarial), and performance.

Second, because a wide range of measurement items for each construct have been developed, I introduce relevant measurement items based on previous work. In terms of PSM, Kim and colleagues (2013) suggest a revised measurement instrument from Perry's (1996) measure of PSM. The revised measures consist of four dimensions and 16 items for an international survey (see Table 3.1). In a survey questionnaire, a multi-point scale such as a Likert scale can be used (e.g., 1 = strongly disagree, 5 = strongly agree). Kim and colleagues note that because "a shared meaning and scaling of PSM may be uncommon" (p. 20), "additional work (combining, omitting, and even adding dimensions) is likely needed to adapt and validate the PSM measure on a country-by-country basis" (p. 19). Therefore, these measurement items can be applied selectively depending on each situation.

Perceptual performance measures that are mostly used in survey designs are generally vulnerable to common source bias. In order to reduce common source bias, the leaders of groups involved in a study will be required to complete survey questionnaires to assess individual- and group-level performance, and then the leaders will not be included in the data (Podsakoff et al., 2003). Some possible measures related to perceptions of performance are presented in Table 3.1. A multi-point scale can also be used for these measurement items. In addition, for group-level performance, a specific index (e.g., procedural efficiency measuring internal efficiency of an organization; see

Petrovsky and Ritz, 2014) can be used to measure perceptions of performance. Even though there has been controversy about whether the concept of “performance” in public organizations is different from that in commercial enterprises (Brewer, 2008), I deal with aspects that public and commercial organizations have in common. Thus, these measures can also be employed selectively.

Since there is a large body of research on measures of structural social network such as network centrality and density and network types such as advice and adversarial relations in the social network literature, I introduce typical measures employed the extant research. Centrality in networks of advice relations is measured by the in-degree²⁰ centrality scores of respondents in networks of positive relationships, while centrality in adversarial network relations is measured by the scores in negative network relations (e.g., Venkataramani et al., 2013). In-degree centrality is a count of the number of actors from which a focal actor has received an amicable or difficult relationship. Relevant questions are presented in Table 3.1. We can assign values to the responses to each question by using a multi-point scale when we are interested in the strength of the relationships (Sparrowe et al., 2001). In particular, in order to empirically examine the propositions in this paper, it is recommended that measurement items for network structure would be measured along a multi-point scale. In-degree centrality “does not suffer from the limitation of self-reports,” because this measure counts only “relations with a focal individual reported by other group members” (Sparrowe et al., 2001, p. 320). On the other hand, network density is measured by the proportion of the number of actual connections to the total number of possible connections (Brass, 2012). When dealing with

²⁰ In-degree centrality refers to the extent to which a focal actor (i.e., ego) is sought after by other actors (Borgatti et al., 2013).

valued relations as discussed above, we can compute density as the sum of the actual response scores divided by the total possible sum of response scores (Sparrowe et al., 2001).

Finally, for an analytical framework, I suggest structural equation modeling-based multi-group analysis to test my hypotheses because my theoretical framework contains mediator (i.e., network centrality and density) and moderator (advice and adversarial relations) variables. That is, this approach is based on the way in which a sample is split into two subgroups that represent different values of the moderator variable, and mediating effects are assessed within each subgroup (Edwards and Lambert, 2007). The moderator variable can serve as an experimental conditions, and thus the significant difference of mediating effects between two subgroups indicates that the mediation is moderated by the moderator variable (i.e., network types) (Edwards and Lambert, 2007, p. 5). In my hypotheses, the effects of PSM on network centrality and density are expected to vary depending on the network types. In addition, the effects of the structural network measures on performance are also expected to differ depending on the network types. A multi-group analysis approach is especially recommended in methodological discussions of structural equation modeling (Rigdon et al., 1998) and moderated mediation (Wegener and Fabrigar, 2000). In my case, one group contains positive network relations (i.e., network centrality and density in advice relations), whereas the other group involves negative network relations (i.e., network centrality and density in adversarial relations). Tests of significant differences across groups are based on χ^2 differences between the model freely estimating the structural coefficients and the model constraining them to be equal across the two groups.

Table 3.1 Measurement Instrument

Construct	Definition	Measurement Item	Source
PSM	An individual's orientation to delivering services to people with a purpose to do good for others and society (Kim et al., 2013, p. 80)	<ul style="list-style-type: none"> ▪ Attraction to public service (4): APP (attraction to public participation, 2); CPI (sub-dimension of public interests, 2) <ul style="list-style-type: none"> APP1: I admire people who initiate or are involved in activities to aid my community APP2: It is important to contribute to activities that tackle social problems CPI1: Meaningful public service is very important to me CPI2: It is important for me to contribute to the common good ▪ Commitment to public values (4) <ul style="list-style-type: none"> CPV1: I think equal opportunities for citizens are very important CPV2: It is important that citizens can rely on the continuous provision of public services CPV3: It is fundamental that the interests of future generations are taken into account when developing public policies CPV4: To act ethically is essential for public servants ▪ Compassion (4) <ul style="list-style-type: none"> COM1: I feel sympathetic to the plight of the underprivileged COM2: I empathize with other people who face difficulties COM3: I get very upset when I see other people being treated unfairly COM4: Considering the welfare of others is very important ▪ Self-sacrifice (4) <ul style="list-style-type: none"> SS1: I am prepared to make sacrifices for the good of society SS2: I believe in putting civic duty before self SS3: I am willing to risk personal loss to help society SS4: I would agree to a good plan to make a better life for the poor, even if it costs me money 	Kim et al. (2013, p. 92)

Table 3.1 (continued)

Construct	Definition	Measurement Item	Source
Performance	Job performance: (a) in-role: performance on required duties; (b) extra-role: performance on discretionary behavior (Sparrowe et al., 2001, p. 320)	<ul style="list-style-type: none"> ▪ In-role performance (7) <ol style="list-style-type: none"> 1. Adequately completes assigned duties 2. Fulfills responsibilities specified in job description 3. Performs tasks that are expected of him/her 4. Meets formal performance requirements of the job 5. Engages in activities that will directly affect his/her performance evaluation 6. Neglects aspects of the job he/she is obligated to perform 7. Fails to perform essential duties 	Williams and Anderson (1991, p. 606)
		<ul style="list-style-type: none"> ▪ Extra-role performance (6) <ol style="list-style-type: none"> 1. Helps others who have been absent 2. Volunteers for things that are not required 3. Orients new people even though it is not required 4. Helps others who have heavy work loads 5. Assists supervisor with his or her work 6. Makes innovative suggestions to improve department 	Smith et al. (1983, p. 657)
	Group performance	<ul style="list-style-type: none"> ▪ Output and efficiency (4) Quality; Value for money; Efficiency; Staff satisfaction ▪ Responsiveness (1) Consumer satisfaction ▪ Service outcomes (3) Effectiveness; Equity; Promoting the social, economic, and environmental well-being of local people 	Walker and Boyne (2006, p. 380)
Centrality	In-degree centrality: the extent to which a focal actor (i.e., ego) is sought after by other actors (Borgatti et al., 2013)	<ul style="list-style-type: none"> ▪ Centrality in networks of positive relations <ol style="list-style-type: none"> 1. Do you consider this person to be a close friend? 2. Do you go to this person for work-related advice and knowledge? 3. Do you talk to this person about confidential work-related matters? ▪ Centrality in networks of negative relations <ol style="list-style-type: none"> 1. Sometimes people at work make us feel uncomfortable or uneasy and, therefore, we try to avoid interacting with them. Do you avoid interacting with this person? 2. Does this person make it difficult for you to carry out your job responsibilities? 	Sparrowe et al. (2001, p. 320); Venkatar -amani et al. (2013, p. 1032)

Note: The total number of measurement items in each construct is provided in parentheses.

Discussions and Conclusion

Implications

For theoretical contribution to the PSM literature, I have employed the concepts of social networks and social capital to suggest specific causal mechanisms between PSM and individual- and group-level performance. This attempt takes a different perspective from that of extant studies focusing on an individual characteristic in terms of the PSM-performance relationship and moves beyond individual consideration. The extant literature has emphasized organizational socialization²¹ as one of the important antecedents of PSM and addressed that it significantly influences human behavior and attitudes (e.g., Brewer, 2008; Pandey and Stazyk, 2008). However, little attention has been paid to the relationship between socialization and performance, even though they assume that a high level of PSM that results from the effect of socialization processes in public institutions may produce better performance (e.g., Brewer, 2008). On the other hand, this article takes the perspective of networked relations among work group members, by which socialization occurs (Morrison, 2002), in order to account for the dynamics of the PSM-performance relationships such that individual's motivations and attributes are reciprocally correlated with interrelationships with other group members (Zhou et al., 2009), and individual behavior occurs as a consequence of these factors (Koehler and Rainey, 2008). In addition, as suggested in the propositions, using social network perspectives including the idea of advice and adversarial network relations helps to identify the challenge of the PSM-performance linkage that remains unsolved in the

²¹ Socialization refers to “the way in which individuals are assisted in becoming members of one or more social groups,” and leads to various outcomes such as “the acquisition of rules, roles, standards, and values across the social, emotional, cognitive, and personal domains” (Grusec and Hastings, 2007, p. 1).

extant research. We can expect and explain more explicitly situations in which even an individual with high PSM sometimes cannot accomplish much or in which a group that consists of individuals with low PSM can perform relatively better than other groups comprised of individuals with high PSM. Furthermore, the approach used in the current paper, applying individual predispositions to a structural network perspective, makes a contribution to the development of the network literature, which has so far ignored individual attributes (Brass, 2012). However, the relative lack of research on PSM using this approach leaves a lot of work to be done.

Limitations and Future Research

The current paper has added a new dimension to the understanding of the PSM-performance link using social network theory with a structural perspective. Although most previous studies have focused on the individual level of analysis, this current approach makes it possible to consider group-level performance as well as individual-level performance using such a property as density. As Perry and colleagues (2010) suggested that further research needs to be integrated with other academic disciplines, future researchers in this field might fruitfully investigate group-level performance using contextual factors in networked relations. However, this paper has focused more on the structural perspectives of a network of relations regarding the network-performance link than on the behavioral perspective, which may lead to a critique that structural approaches to networks might ignore social relationship qualities embedded in networks and then inadequately specify how networks function (Uzzi and Gillespie, 2002). Therefore, further research may be required to theorize about the causal mechanism of content factors within networks and calculate relationship qualities related to the

network-performance link in order to examine the full impacts on the outcomes of individuals' trust, belief, and behavior in a network of relations. It is expected that the relationship between PSM and performance varies depending on the level of relationship qualities.

In addition, testing the suggested propositions requires capturing network types (i.e., advice and adversarial) and structural properties (i.e., centrality and density) through conducting surveys or interviews. When doing, future researchers should make sure to reduce common source bias in order to avoid identifying spurious relationships between explanatory and response variables (e.g., Meier and O'Toole, 2013) with regard to respondents' self-reported perceived performance and relationship types. One of the major causes of common source bias is that the predictor and response variables are obtained from the same source or rater. Obtaining measures of both variables from different sources is one way to remedy the bias (Podsakoff et al., 2003). For instance, researchers can obtain measures of employees' performance from their managers and measures of organizational performance from archival sources. Meier and O'Toole (2013) recommend avoiding the use of raters' self-perceptions of performance as a dependent variable but also make some recommendations of how to reduce common method bias in case using the same survey instrument to collect both perceptions of performance and independent variables is unavoidable (see Meier and O'Toole, 2013, p. 15; Petrovsky and Ritz, 2014, p. 65).

Due to the practical difficulty of collecting usable and appropriate data in terms of negative relationships because of the necessity of multi-item measures for the relationships (e.g., perception, affected feelings, and behavioral intentions), proxies may

be used in a survey question to identify social networks with negative relationships such as the affective component of relationships, especially examining large networks (Labianca and Brass, 2006). However, when a survey is conducted at the workgroup level, it is recommended to use multi-item measures because single-item measures such as prefer-to-avoid response items do not capture all negative relationships (Labianca et al., 1998). In addition, with regard to group performance and negative relationships, I would suggest that network relationships be captured in a whole network (rather than an egocentric network) in order to capture the whole network perspective (e.g., density). Because an ego network is a part of a whole network that necessarily involves a particular actor (i.e., focal actor or ego) and information on others who are connected with egos is collected from the egos, the collected information may not precisely reflect the characteristics of a whole network. Therefore, a measure for a whole network perspective such as density or centralization should be used to describe and capture entire networks.

To suggest a new insight to PSM researchers, I end this paper quoting the following: It may be appropriate that the study of organizational behavior focuses on the attributes of individuals in organizations; however, “to focus on the individual in isolation, to search in perpetuity for the elusive personality or demographic characteristic that defines the successful employee is failing to see the entire picture” (Brass, 2012, p. 667).

Chapter Four

The Effects of Collaborative Behaviors between Superiors and Middle Managers on Organizational Performance: Evidence from Kentucky Public Schools

Introduction

As society has become more complex due to the development of knowledge and technologies as well as the concomitant conflicts of interest that may cause complicated internal and external environmental changes for each individual or organization, societal problems cannot be easily solved by a single entity such as an individual, group, or organization. In other words, all entities that play a role in handling a specific societal problem need to collaborate with each other by sharing knowledge and experience and by reducing potential conflicts of interest. Public organizations and their managers and employees are no exception to this phenomenon. As societal problems become more complex, the role of government has also become more organizationally and administratively complex (e.g., McGuire and Silva, 2015). For instance, after a natural disaster such as Hurricane Katrina in 2005, collaboration to relieve suffering was necessary among various parties in the local and national arenas. In addition, collaboration between government agencies and other parties could enhance agencies' legitimacy in the environment in which they operate and justify their activities (Longoria, 2005).

Accordingly, inter-organizational collaboration has become an important issue in the public management field. However, there has been little research on intra-organizational collaboration even though public administrators are charged with accomplishing shared goals and tasks in collaborative settings and each participating

entity plays a different role in the collaboration process (McGuire and Silva, 2015). In addition, this internal collaborative behavior can be a potential way to stimulate new strategies, especially in a professional organization (e.g., Diamond and Rush, 2012; Huxham and Vangan, 2000). Therefore, this study focuses on intra-organizational collaboration because intra-organizational management may be a breeding ground for the success of inter-organizational collaboration. Moreover, along with examining the linear effect of collaborative behavior, this study also focuses on the moderating role of collaboration as well as the effects of internal and external resources on performance. This study builds on Bedwell and colleagues' (2012, p. 3) definition that encompasses various definitions of collaboration as "an evolving process whereby two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal." In short, collaboration is a process that involves interaction among actors including people and organizations and occurs between a variety of entities including individuals, groups, organizations, and societies (Bedwell et al., 2012). That is, collaboration can occur both inter- and intra-organizationally, including across social entities (e.g., an individual and another organization).

This study tests various hypotheses regarding the effects of collaborative behavior and several external resources on organizational performance, from a school-level standpoint, with data from three sources: the Kentucky Education Professional Standard Board, the Kentucky Department of Education, and the National Center for Education Statistics Common Core Data. The data set includes information about 176 school districts and 1,279 K-12 schools across the school years from SY 2002-3 to SY 2008-9. The arena of education appears to be an appropriate example to address the concern of

the effects of collaborative behavior because public education is one of the most important policy arenas in the United States.²² It features many aspects related to collaborative interaction such as interactions between superintendents and their principals, joint activities among various units, and shared goals. For collaborative behavior, this research focuses on a specific professional program (i.e., the AMSP²³ program) as a shared goal among participants in a collaboration process. Furthermore, when analyzing organizational performance as well as individual performance, the external and internal conditions (environment) an organization faces must also be considered and identified.

This study contributes to the theoretical development of the collaborative management literature in the public management field by employing a general perspective of collaboration and a contingency leadership perspective. The empirical results from the study support that collaborative behavior of managers (i.e., school principals) has a positive and significant linear impact on student achievement.

Furthermore, the findings indicate that the effect of the leader's economic reward (i.e.,

²² The total government spending in the U.S. for FY 2014 was about \$ 6.2 trillion, and the subtotal government spending regarding education functions was approximately \$ 0.9 trillion (15%). Furthermore, the portion of the state and local government spending for education increased to 28%, indicating that the arena of education is one of the most important parts among various state and local government functions. In addition, some researchers suggest taking up the study of school districts in rural regions of the United States because the majority (53% in 2013, National Center for Education Statistics) of public school districts in the United States are located in rural areas but little attention has been paid to them in the education literature (see Bedwell et al., 2014).

²³ The Math Science Partnerships (MSP) program funded by the National Science Foundation was launched in 2002 and funds "innovative collaborative efforts between K-12 institutions, institutions of higher education and community organizations aimed at achieving common educational goals" (John et al., 2008, p. 3). The Appalachian Math and Science Partnership (AMSP) functions in the states of Kentucky, Tennessee, Virginia, and West Virginia. This research focuses only on Kentucky districts because of data availability. The AMSP professional development program aimed to improve teacher productivity, and the target participants in this program were K-12 teachers including principals from 38 school districts in Kentucky. It ultimately depended on a teacher's decision to participate in the AMSP program, and some teachers even participated if their principals or superintendents did not participate

salary) varies depending on subordinates' collaborative behaviors. Accordingly, the research contributes an empirical assessment of the linear and nonlinear impacts of collaborative behavior that has not been fully addressed.

In the first part of the study, I will discuss the concept of collaboration and the contingency leadership perspective in order to account for the relationship between collaborative behavior and its outcomes. I then propose a theoretical framework and accompanying hypotheses regarding collaborative behavior, characteristics of districts, and performance based on a literature review. Next, methods for time and district fixed effects panel regression analysis will be considered and the results will be presented. In particular, this methodological approach can reduce bias from omitted variables and examine a reverse causal direction. Finally, some discussion and suggestions based upon the analyses will be provided in order to further the academic debate on collaboration and its nonlinear effects and offer suggestions for the practical implementation of the findings.

Theoretical Framework and Hypotheses

Collaboration and Performance

Theoretical Background: Collaborative Management, Contingent Leadership, and Organizational Performance

As societal issues and problems have become increasingly sophisticated, the roles and functions of public service organizations have evolved from government to governance to address complications (e.g., Gray, 1989; O'Leary and Vij, 2012; Osborne, 2006). Accordingly, public management scholars and public managers have given attention to ways to work cooperatively with other organizations including individuals

and work-groups, to resolve such issues and problems that are not easily solved by a single actor. In particular, this kind of public management scholarship has developed broadly based on two approaches: managerial (e.g., strategies or a choice) and structural (e.g., networks) aspects (e.g., Meier and O'Toole, 2005; Provan and Milward, 1995). This study focuses on the managerial aspect, and more particularly, on the effects of collaborative interaction on organizational performance.

Definitions of Collaboration. While a number of scholars have studied collaboration, collaborative relationships, or collaborative public management, there is a lack of consensus on the definition of collaboration (O'Leary and Vij, 2012). Gray (1989, p. 5) defined it as “a *process* through which *parties* who see different aspects of a problem can constructively explore their differences and search for *solutions* that go beyond their own limited vision of what is possible.” Meanwhile, Huxham (1996, p. 1) defined inter-organizational collaboration as “a very positive form of working in *association* with others for some form of *mutual benefit*.” In the public management field, collaborative management refers to “the *process* of facilitating and operating in *multiorganizational* arrangements to solve problems that cannot be solved, or solved easily, by single organizations” (Agranoff and McGuire, 2003, p. 4). Common denominators of the definitions are that collaboration or collaborative management is a process whereby two or more actors are mutually engaged in joint activities in order to resolve problems that cannot be easily solved by a single actor.

One thing we have to recognize when understanding collaboration or collaborative management in the extant literature is that the definition of collaboration has centered on inter-organizational arrangements (i.e., between organizations or sectors).

In particular, most scholars who study collaborative public management have considered collaborative public management as a process in multiorganizational arrangements, working across boundaries or sectors (e.g., Agranoff and McGuire, 2003; Bingham et al., 2008; Sullivan and Skelcher, 2002). That is, they emphasize not only collaboration among organizations but also connection with the public and civic engagement. Intra-organizational collaboration (e.g., within a work group or among colleagues in the same organization) has been given less attention, especially in the area of public administration, because of a recent shift in emphasis of perspectives from management within public organizations to management across organizations (Morse, 2008). Nevertheless, intra-organizational management and collaboration can be a breeding ground for the success of inter-organizational collaboration. Bedwell and colleagues (2012, p. 130) encompass various definitions of collaboration as “an evolving process whereby two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal” regardless of the distinction between inter- and intra-organizational collaboration. This study builds on Bedwell and colleagues’ definition to investigate collaborative interactions in public education.

Components of Collaboration. Broadly speaking, there are several components that are critical to identify collaboration: evolving process, multiple participants across a variety of entities, reciprocal relationship and joint activities, and achievement of a shared goal (Bedwell et al., 2012). That is, collaboration is a process which has a dynamic and evolving nature and by which participants interact together over time (e.g., Graham and Barter, 1999; Gray, 1989; Wood and Gray, 1991). This process involves interaction among multiple participants across various social units including individuals, work-

groups, and organizations (e.g., Graham and Barter, 1999; Longoria, 2005). For instance, collaboration can occur not only between entities at the same level such as public schools, but also across levels such as school district and schools. In addition, collaboration can occur between a single school district and a principal. Collaboration also requires a reciprocal interaction and influence among entities who participate in the process (e.g., Agranoff and McGuire, 2003; Longoria, 2005). Moreover, collaboration requires each entity to participate in joint activities both within and outside of the work environment to accomplish their missions (e.g., Bedwell et al., 2012; Graham and Barter, 1999). Finally, the process of collaboration is required to accomplish a shared goal among involved entities (e.g., Graham and Barter, 1999; Wood and Gray, 1991).

In this study, drawing upon the components of collaboration, my major concern is with the collaborative interaction with organizations including individuals as part of the organizations. I am also concerned with positively oriented intra-organizational connections, although there could be a possibility that each entity participating in the process has different and even conflicting goals, resulting in unintended solutions or fiscal waste (e.g., Helling, 1998; O’Looney, 1997). More specifically, this paper investigates the effect of collaborative interaction between district superintendents and school principals in their districts on school-level student achievement. Intra-organizational collaboration may occur in two ways: through vertical and horizontal collaborative behavior (Likert, 1967). In particular, with regard to vertical collaboration, it occurs between superiors and subordinates and needs to be distinguished from ordering or mandatory compliance (i.e., coercive mechanisms of hierarchical systems). Most public organizations utilize coercive mechanisms of monitoring and sanctioning rather

than incentives to motivate subordinates (Miller and Whitford, 2007). Whereas such direct orders from superiors may usurp subordinates' managerial authority, vertical collaborative behavior requires their own independent authority (e.g., decision making) and non-coercive relationship (Campbell, 2016; Mullin and Daley, 2010). Meanwhile, for frontline employees, collaborative behavior is determined by informal partnership with their superiors rather than formal authority and hierarchy (Campbell, 2016). Based on this rationale, this study identifies the effects of vertical collaboration between superintendents and their principals.

Public school districts are categorized as local governments, but their structures are different from typical local governments such as county and municipal governments. From the point of view of governmental agency and organizational function, a school district is a high-level administrative authority to each school because the superintendent is responsible for evaluating and making recommendations to hire and maintain principals as well as developing and maintaining a healthy school budget. In this case, the connection between a school district and schools could be considered interaction within a single organization. On the other hand, from an institutional perspective, school districts mainly have administrative purposes such as recommendations about daily operations for the district and the development and maintenance of a school budget, whereas schools primarily have instructional purposes such as teaching students and overseeing faculty/staff in a school building (Bidwell and Kasarda, 1975). In light of this aspect, school districts and schools are different purposeful structures and could be treated as different organizations though they have shared goals, such as a high-level of student achievement.

Contingent Leadership. Individuals not only participate in a process of collaboration, but also serve as representatives of their work-groups or organizations in the course of collaborative activities (e.g., Huxham and Vangen, 2005). Consequently, who is a leader in a work-group or an organization and what type of management style the leader has would be important factors for the success of collaboration because these collaborative activities and accompanying group or organizational performances may be influenced by leadership within each entity (e.g., Fiedler, 1994). In this paper, two types of leaders are discussed: school superintendents and principals. The school superintendent is the chief executive officer of a school district and responsible for the success of the district as he or she acts in administrative roles such as making recommendations about daily operations for the district, supporting legislative proceedings, and maintaining a healthy school budget (Office of Education Accountability, 2013). The school principal is a manager who oversees the daily operations of an individual school building and is responsible for the school success by monitoring students, faculty, and staff and building community relationships within the school area (Sharp and Walter, 2003). Many studies have found that strong leadership of both school superintendents and principals is vital to successful districts and schools (e.g., Edmonds, 1979; Maden, 2001).

A contingency perspective of leadership emphasizes that leadership outcomes and the performance of interaction groups are associated with matching a leader's style to appropriate situations (e.g., Ashour, 1973; Fiedler, 1964). In terms of the situations, contingent leadership theory suggests three factors affecting leaders' influence: affective leader-member relations, task structure, and positional power (Fiedler, 1964). The

leader's favorable interpersonal attitudes positively influence group performance (e.g., Fiedler, 1962; Godfrey et al., 1957). The level and speed of job completion of a leader depend on his or her task's clarity and ambiguity; for instance, it is relatively easier for a leader whose job is highly structured to complete a task than for one whose job is vague and unspecific (Fiedler, 1964). The power inherent in the leadership position involves reward and punishment at the leader's disposal as well as the authority the leader has over subordinates, through which the leader can influence their productivity (Fiedler, 1964). Unlike firms in the private sector, in certain public organizations such as public schools and districts, leaders' positional power and task structure are similar across each school and district. However, this does not mean that their task structure and positional power are low because they are laid down in relevant statutes, indicating that the influence of leader-member relations on leadership outcomes would be the most important among the three factors that explain variations in the outcomes. In their Leader-Member Exchange theory, Graen and Uhl-Bien (1995) argue that effective leadership processes result from mature leadership relationships between leaders and subordinates. This perspective assumes that interactions provide a foundation of incremental influence (Katz and Kahn, 1978). For school leadership, for example, some scholars have found that the school principal's participative leadership positively influences teachers' participation in a professional development program (e.g., Bedwell et al., 2014).

Organizational Performance. In this study, I investigate the effects of several explanatory variables (e.g., leader's characteristics, manager's participation, characteristics of school districts) on organizational performance. Organizational

performance will be defined in terms of school-level students' academic achievement. I specifically focus on two particular subjects, mathematics and science, because of their significance in discussions of competitiveness in contemporary American public education and the importance of the public professional development program (i.e., Appalachian Math and Science Partnership) discussed in this paper. This kind of school performance may be influenced by school characteristics and district characteristics as well as school leadership types (e.g., Barrett et al., 2015; Hallinger et al., 1996; Leithwood and Jantzi, 2008; Meier and O'Toole, 2001).

Collaborative Behavior and Performance

The process of collaboration requires each entity to participate. Collaboration occurs in various settings both in a vertical structure through levels of entities and in a horizontal structure in which an array of entities participate (e.g., McGuire, 2006). In terms of intra-organizational collaboration, a collaborative process also demands vertical collaborative behavior between leaders and subordinates as well as horizontal collaborative behavior among colleagues (Likert, 1967; Scott and Davis, 2007). In particular, in the public sector, the collaborative effort of agency leaders is a key to be successful in implementing their shared missions, programs, and strategies (e.g., Pynes, 2009) because their effort can remove certain situations in which different interests and goals undermine their shared ones, leading to the better use of scarce resources and enhanced synergy (e.g., Pollitt, 2003). Many scholars suggest that inter- and intra-collaboration is one of the effective factors positively affecting organizational performance (e.g., Andrews et al., 2006; Aram et al., 1971; Whitford et al., 2010). In the literature on intra-organizational collaboration, this philosophy is based on a fundamental

premise of collaboration in the working environment; that is, entities participating in a collaborative process can enhance individual, group, or organizational performance by working together and cooperating and by sharing information, experiences, and knowledge with superiors, subordinates, and other members (e.g., Aram et al., 1971; Zárrega and Bonache, 2003). In addition, leader-member exchange (LMX) theory shows the linkage between leader-member exchange and organizational performance, identifying significant relationships between them (Gerstner and Day, 1997; Wang et al., 2005). LMX theory explains the varying quality of a leader's relationships with subordinates. For the completion of work, leaders develop high-quality exchanges with their subordinates, which are expressed, for example, as trust, influence, liking, and respect (e.g., Schriesheim et al., 1999). For instance, Bedwell and colleagues (2014) found significant effects of school principals' participation in a professional development program on the likelihood of subordinates' (i.e., teachers) participation in the program. This rationale leads to the following hypothesis:

Hypothesis 1: The collaborative relationships between superintendents and their school principals have a positive effect on organizational performance.

School District Characteristics as External Environment and Performance

An open system perspective notes that organizations have the capacity for self-maintenance through interaction with the environment. Schools as organizations take in resources from the environment to survive and produce better outcomes (e.g., Scott and Davis, 2007; Pfeffer and Salancik, 2003). Because schools and their members are a part of the environment (i.e., districts), they are inevitably influenced by the environment that

provides some visible and invisible sources needed to schools (Weick, 1995). The environment such as the characteristics of superintendents and school districts may significantly affect organizational performance (e.g., Pfeffer and Salancik, 2003; see Figure 4.1). However, little research has empirically examined the impacts of these predictors on school performance. Accordingly, this study will examine the relationships between organizational performance and superintendent’s managerial capability and economic rewards, stability, and experience as well as the school district’s size and fiscal resources.

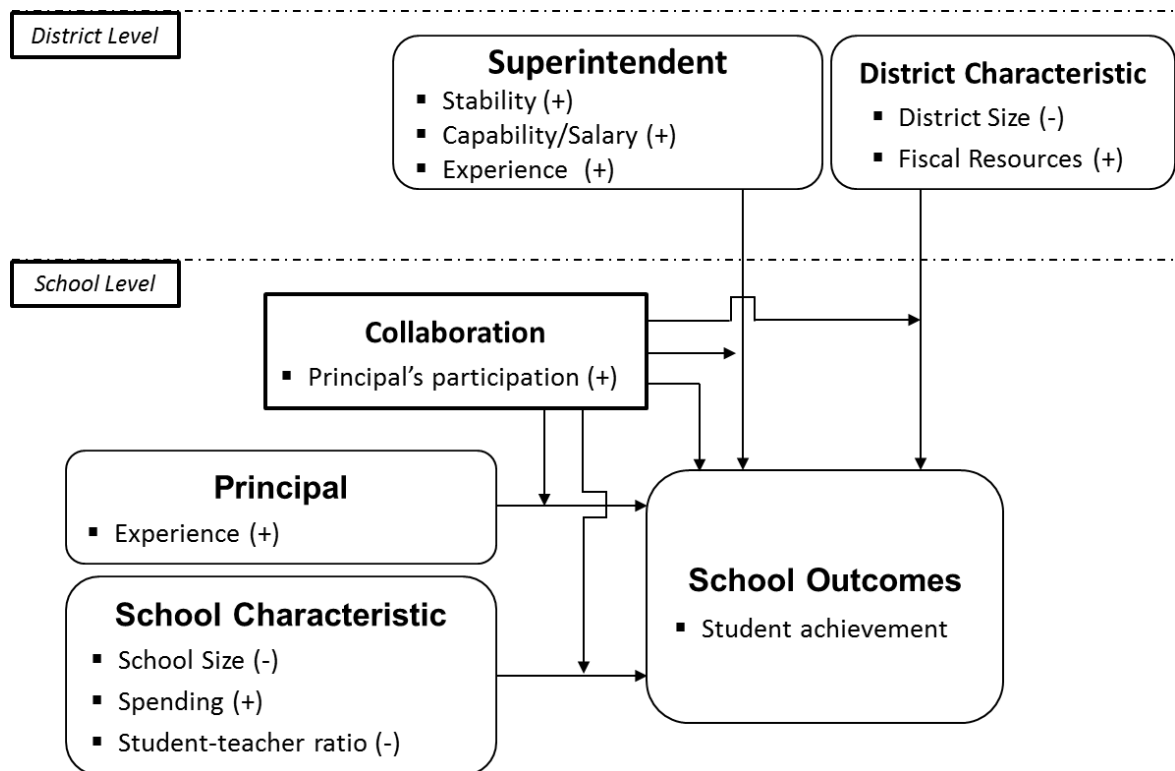


Figure 4.1 Theoretical Framework for the Relationship between School Leaders and Organizational Outcomes

Managerial Capability and Economic Rewards and Performance

Many studies have indicated that public management may differently influence organizational performance depending on managerial quality (e.g., Meier and O'Toole, 2002). Managerial quality is defined as the ability to do accurately and appropriately some activities in which managers have opportunities and constraints to influence organizational outcomes (Finkelstein and Peteraf, 2007). According to Finkelstein and Peteraf, this ability is an important type of managerial capability. Managerial capability refers to the ability of managers to establish and maintain relationships with other actors who are encouraged to engage, including leadership quality, collaborative decision making, and learning ability (Agarwal and Selen, 2009). Consequently, such managerial efforts of top management or managers and their quality could be associated with various factors such as different types of leadership, management characteristics, and incentives (e.g., Brewer and Selden, 2000; Hennessey, 1998; Meier and O'Toole, 2002). For instance, Hennessey (1998) found that the leadership and efforts by individuals influence public organizational outcomes via organizational culture. In addition, some researchers suggest certain managerial characteristics for success in public service delivery, such as entrepreneurial aspects (e.g., Gray, 1996) and conserving efforts (e.g., Terry, 2015). Meanwhile, some researchers, especially in the private sector, suggest that given a competitive labor market for executives, their managerial capabilities could be reflected in the economic rewards (i.e., salary) they receive (Hitt et al., 1997). Furthermore, a number of empirical findings support a positive relationship between superintendent salary and academic performance (e.g., Giroux and Willson, 2006). The following hypothesis is therefore proposed:

Hypothesis 2: Individual managers who (a) have better managerial capability or (2) receive better rewards are more likely to positively influence organizational performance.

Managerial Stability and Performance

Although the stability of personnel in a government bureaucracy has been taken as a given, managerial stability has received attention as one of the most important factors in an administrative system because instability may place limitations on “building competence, mutual trust, and long-term commitment,” which are positively associated with better organizational performance (O’Toole and Meier, 2003, p. 46). Some studies have addressed the effects of managerial stability on organizational performance (e.g., Meier et al., 2007; Milana and Maldaon, 2015; O’Toole and Meier, 2003). O’Toole and Meier (2003) suggest several dimensions in terms of stability²⁴: structural stability, mission stability, production or technology stability, procedural stability, and personnel stability. Managerial stability is a type of personnel stability defined as “consistency in top leadership” (Meier et al., 2007, p. 366). O’Toole and Meier (2003) emphasize the importance of personnel stability among various types of stability, suggesting that managerial change may lead to instability in the administrative system and thereby result in low-quality work. More specifically, O’Toole and Meier (2003) provide a theoretical basis for such stability in which it is argued that a sufficient learning period is required

²⁴ Structural stability refers to “the preservation of organizational features over time” including “size, formalization, differentiation, and span of control”; mission stability is defined as “the consistency over time of the goals of an administrative unit”; production or technology stability refers to the stability of an agency’s core technology as it influences governance arrangement; procedural stability is “the set of rules, regulations, and standard operating procedures used in a public agency”; and personnel stability is the consistency over time of career employees “who occupy positions within the organization” (O’Toole and Meier, 2003, p. 46).

for managers to acquire some knowledge of the job and to learn institutional and administrative contexts and that enough time for other stakeholders is necessary for them to understand top management's style and thus build trust through familiarity. Through such relationships, the top leader could strengthen his or her autonomy, which is a key factor to influence performance (Travers et al., 1997). Some empirical findings support that the length or continuity of superintendent's service has a positive relationship with student achievement (e.g., Myers, 2011; O'Toole and Meier, 2003; Waters and Marzano, 2006). However, little empirical research exists on managerial stability in rural school districts. This rationale leads to the following hypothesis:

Hypothesis 3: Managerial stability will be positively associated with organizational performance.

Professional Experience of Superiors and Performance

Generally, experience is associated with an acceptable level of task proficiency and independent professionalism which may positively influence individual performance (e.g., Ericsson, 2006). This argument is based on the assumption that experience and training in phases develop individuals' abilities, reduce and avoid gross mistakes, enhance automated skills to complete their jobs, and thus make a difference in individual performance, even though attainable performance can be constrained by the individual's own capacities and innate talents (e.g., Ericsson, 2006; Simon and Chase, 1973). Whereas many studies have investigated the relationship between working experience and job performance (e.g., Avolio et al., 1990; Ericsson, 2002), few researchers have paid attention to organizational performance in terms of the effect of professional experience (e.g., Meier and O'Toole, 2003). Drawing on cognitive resource theory (Fiedler, 1986),

some researchers elaborate on the relationship between cognitive resources (e.g., experience and intelligence) and performance (Fiedler and Garcia, 1987). In the case of a school district, years of instructional and administrative experience of a superintendent, as the external environment to schools, could affect school performance (e.g., Nicholson-Crotty et al., 2012). Thus, I posit:

Hypothesis 4: The superintendent's professional experience positively influences organizational performance.

District Size and Performance

In terms of district characteristics that influences student achievement, there are at least two factors that must be examined: district size and fiscal resources (Bidwell and Kasarda, 1975). While a large body of studies has examined various antecedents of school outcomes, few have investigated the impacts of school district size as an external environment to schools (e.g., Bidwell and Kasarda, 1975; Driscoll et al., 2003). Here, district size refers to the total number of students enrolled in each district. Broadly, there are two perspectives on the impacts of district size. On one hand, the different needs of each school and pupil in large districts would not be met when a district-level decision has a decisive effect on school-level autonomy in decision making, which may lead to a lack of communication and a low level of accountability, and thus may have negative impacts on student achievement (e.g., Driscoll et al., 2003). On the other hand, a centralized administration and decision-making process could enable large districts to provide a greater financial investment to each school (e.g., Streifel et al., 1991), and thus the impact of economies of scale on education results in positive school performance (Chakraborty et al., 2000). However, most of the extant literature on the relationship

between organization size and its outcomes emphasizes the problems of communication and inefficiencies in service provision and management in large organizations (e.g., Kiesling, 1967; Fowler and Walberg, 1991). In the public education context, the larger a school district is, the more difficult it will likely be to improve the educational production and instructional decision-making processes. This may hinder educational achievement in schools (e.g., Bidwell and Kasarda, 1975; Driscoll et al., 2003), even though there have been some suggestions with regard to economies of size in education that emphasize efficiency of district consolidation (Andrews et al., 2002). Consequently, I predict:

Hypothesis 5: School district size is negatively associated with organizational performance.

Fiscal Resources and Performance

According to traditional organizational open system theory, work groups and organizations have boundaries which segregate their own systems from their environments. These boundaries also play a role as a filtering system in identifying activities of groups and organizations and matching their resources with environmental opportunities such as an influx of members and other internal and external resources of an organization into the system (e.g., Ancona, 1986; DiPaola and Tschannen-Moran, 2005; Santos and Eisenhardt, 2005). As societies become more complex (i.e., conditions of high uncertainty), the boundaries between groups and organizations and their environments are becoming blurred and thus the contextual and physical aspects of each boundary should be considered together when interdependence between them occurs (Christensen and Lægreid, 2007; Santos and Eisenhardt, 2005; Scott and Davis, 2007). In other words, uncertain environments could influence structural and contextual aspects of

groups and organizations. One of the most important resources affecting group and organizational outcomes is fiscal resources. In this paper, fiscal resources refers to the amount of expenditure by a school district. Many scholars have found evidence that ample financial resources lead to the completion of tasks (e.g., Ancona and Caldwell, 1992). In terms of public education, for instance, fiscal controls at the district level could constrain adoption of innovative programs and resource use at the school level (Driscoll et al., 2003). The following hypothesis is proposed:

Hypothesis 6: Fiscal resources of school districts as an external resource have a positive effect on organizational performance.

Moderating Effects of Principals' Participation on Performance

As discussed earlier, principals have two important roles in public school settings. They act as (middle) managers serving as a bridge between school districts and their schools, and they are responsible for economic efficiency and accountability gains across the education process. They also act as leaders in a school in which they may collaborate with teachers regarding instructional matters to improve teaching quality and student outcomes. Thus, we can assume that given identical internal and external resources, the level of collaboration between principals and superintendent as well as between principals and teachers could differently influence student academic achievement. In other words, principals' collaborative behaviors in respect of superintendents' instructional decisions could offset or intensify any effects of factors in internal and external environment on student achievement. In addition, with regard to the collaborative relationship between principals and teachers, some researchers found that principals' collaborative behavior helps teachers participate in professional development

programs (Bedwell et al., 2014). In general, there is a large body of research confirming that professional development programs positively influence student achievement (e.g., Barrett et al., 2015; Darling-Hammond, 2000), although the association between collaborative behaviors and organizational outcomes has not yet been fully investigated.

Many studies on collaboration indicate that collaborative behaviors produce an atmosphere of interpersonal trust and mutual support and respect, thereby creating volitional compliance among entities participating in a collaborative process (e.g., Mohr et al., 1996; Rhodes and Beneicke, 2002). Consequently, collaborative activities enable participating entities to share information and resources, engage in extra-role behaviors, or favor expected long-term benefits, thereby leading to better performance (e.g., Morgan and Hunt, 1994). As a result, it is expected that collaborative behaviors between superintendents and their principals moderate the effects of several factors of internal and external environment. For instance, even though expenditure per pupil of a certain school is less than that of others, the school could yield better test scores when there are collaborative activities in the school. In the study, therefore, I will examine the moderating effects of collaborative behavior between a superintendent and principals on the relationship between student achievement and several predictors such as superintendent's capability and economic rewards, internal and external fiscal resources, teacher salary, and principals' experience.

Methods

Data

The data used in this study come from three sources: the Kentucky Education Professional Standard Board (KEPSB), the Kentucky Department of Education (KDE), and the National Center for Education Statistics Common Core Data (CCD). The data set includes considerable information about 176 school districts and 1,279 K-12 schools in the state of Kentucky and is an unbalanced panel at the school- and district-level across the school years from SY 2002-3 to SY 2008-9. Using records provided by KEPSB, 2,103 unique principals were identified. The districts differ widely in various aspects including superintendent and principal characteristics (i.e., gender, experience), resources (e.g., sizes, spending per pupil), school types, and performance. For each superintendent and principal, there are data on gender and experience. Superintendents' salaries and stability are also included. Of particular interest for the purposes of this study are partnership of school districts and participation of schools in terms of AMSP (i.e., professional development program). Among the total of 176 districts, 38 are AMSP partner districts, and the 551 schools and 606 principals participated in the AMSP program. School-level data from KDE and CCD about percentage of students on free or reduced-price lunch program, average teacher salary, teacher experience, and percentage of teachers with master's degrees are also included. School district-level data such as superintendents' salary, stability, and experience, district-level expenditure, and average enrollment come from KDE. Finally, standardized test scores retrieved from KDE for each school act as a dependent variable. Descriptive statistics are presented in Table 4.1.

Because this analysis includes a cross-sectional time-series approach with two levels, I employed a two-way fixed effects model using within-transformation and district-clustered standard errors, through which the heterogeneity of individual districts and serial correlation of individual years could be wiped out (Baltagi, 2008; Sniders and Bosker, 1999). Even though the data set is an unbalanced panel, the estimators will be unbiased because some missing data for certain years are not correlated with the idiosyncratic errors that are “those unobserved factors that change over time” and influence the variance of a response variable (Wooldridge, 2013, p. 491).

Dependent Variable: Organizational Performance

I included school-level student academic achievement as a dependent variable. The standardized test score combining both math and science is used to represent organizational performance. Because this study focuses on the AMSP professional development program with regard to the collaborative process and activities, the math and science index scores are relevant. In Kentucky, however, there was a period of transition in terms of state-level standardized tests. Prior to the 2005-6 school year, Kentucky gave different subject tests²⁵ (i.e., CATS: Commonwealth Accountability Testing System) to students in different grade levels. A revised iteration of the testing was employed in the 2006-7 school year in which Kentucky tested all students differently than the previous test, leading to less reliable test score data (see Barrett et al., 2015, p. 5). In addition, there were different scales on the scores of each test, which result in lack

²⁵ The state of Kentucky tested math in grades 3, 5, 6, 8, 9, and 11; reading in grades 3, 4, 6, 7, 9, and 10; and science in grades 4, 7, and 11 (Barrett et al., 2015, p. 5).

of reliability in test score data. Therefore, I converted the raw test scores to Z-scores²⁶ based on state average for each school level (i.e., elementary, middle, and high schools) and each school year. Since there is a very strong correlation²⁷ between the math and science indices²⁸, I created a composite of Z-scores from them, ranging from -2.95 to 3.61 (see Table 4.1).

The measure of school-level student achievement is a specific indicator of organizational performance, so there should be free from common source bias, which is an emerging issue in the public management field when measuring perceptual organizational performance, although such performance indicators have been controversial with regard to the reliability and validity of the measure (Meier and O'Toole, 2013).

Explanatory Variables

Collaborative Behavior

Collaboration is a process in which two or more actors reciprocally engage in joint activities to achieve goals and objectives. In particular, Whitford and et al. (2010, p. 323) posit that intra-organizational collaboration occurs “when people within an organization work together to achieve common goals through communicating and sharing strategies, knowledge, resources, and information.” Although collaboration is a difficult concept to define and measure, some researchers have measured it in terms of support

²⁶ Z-scores are a nonlinear transformation and are frequently used for standardizing student test score data across multiple exams and scaling challenges (Barrett et al., 2015, p. 5).

²⁷ Elementary school: $r = 0.73$; middle school: $r = 0.82$; high school: $r = 0.86$.

²⁸ The index is calculated based on a formula developed by the KDE. It identifies eight performance levels and then calculates the percentage of students within each level multiplied by that level's weight. Those eight values are then summed to provide an index on a scale, ranging from 0-140 (Barrett et al., 2015, p. 5).

and integration, authentic communication, and knowledge-based risk taking (Aram et al., 1971), information and resource sharing, goal congruence, decision synchronization, communication, and joint knowledge creation (Cao and Zhang, 2011) as well as active participation in decision making, communication, and knowledge sharing (Whitford et al., 2010). These collaborative behaviors continuously occur during the process and finally influence collaborative outcomes (Thomson and Perry, 2006).

Most of the extant research has measured collaboration based on perception with respect to collaborative behaviors. In this study, however, collaboration was measured by the actual interactive activities that occur between superintendents' clear endorsements with regard to being in partnership with the AMSP professional development program and their principals' active participation in the AMSP program. Districts' participation in the AMSP program was not mandatory, so only the 38 district superintendents among 72 districts located in rural areas agreed to participate in the program. This membership in the AMSP was consistent over the course of the grant (John et al., 2008). In addition, all participation by teachers (including principals) from schools within these districts was voluntary, so not all teachers or schools in a partnership district participated. In order to submit a proposal to participate in and develop the AMSP program, superintendents had to continuously work together with their principals and teachers as well as their partners (i.e., higher education institutions; AMSP, 2003; John et al., 2008). Some principals also attended the AMSP training programs along with their teachers to further encourage participation of teachers and help eliminate the achievement gap in K-12 math and science in the region (Bedwell et al., 2015; John et al., 2008). In this case, both the superintendent and the principal have a shared goal: student academic achievement.

Therefore, we can assume that principals' participation in the AMSP program in the selected districts represents an active and strong collaborative behavior. To measure collaborative activities, some researchers counted the number of activities and then transformed this to the proportion of collaboration (Scholz et al., 2008). In this paper, collaborative behavior was measured by principals' participation as a dummy variable in the individual years, given that superintendents had made partnerships with AMSP.

Managerial Capability (Quality) and Economic Rewards

Managerial capability is a difficult concept to measure because of its multifaceted dimensions. Broadly, there are two approaches to measure this concept: "the economic-market-derived" and "the behavioural and human resource management" approaches (Vigoda and Yuval, 2003, p. 13). According to the former perspective, managerial quality and capability are reflected in financial values such as pay and salaries (e.g., Angel and Fumas, 1997; Kahn, 1993). In contrast, some scholars suggest alternative ways to measure managerial quality and capability from a human resource aspect because the financial value approach may not fully explain the variance in managerial quality and capability (e.g., Koch and Cabula, 1994; Thompson and Heron, 2005). For instance, Vigoda and Yuval (2003, p. 13) provide several key elements of managerial quality such as "human quality and professionalism," "acceptance of transparency and accountability as leading administrative values," "commitment by organizational members to morality and ethics as desirable codes of behavior," and "innovation and creativity of public personnel." In addition, Thompson and Heron (2005, p. 1038) suggest "management skills, knowledge and attitudes." Meanwhile, Meier and O'Toole (2002) explored a

measure based on the residual²⁹ from a model predicting the superintendent’s actual salary. Many researchers have used financial and market-derived measures as a proxy for managerial capability or quality regardless of whether the organization was in the public or private sector (e.g., Berri and Krautmann, 2006; Gerhart and Milkovich, 1990; Mensah et al., 2013).

In Kentucky, a superintendent salary includes “base pay as well as additional pay such as payment for unused vacation days, or payment for additional job duties” (Office of Education Accountability, 2013, p. 38). There are three types of raises: merit raises, annual raises, and annual increment raises. In particular, a merit raise is based on evaluation of job performance of the superintendent, not just on assessment of student achievement, and the others increase each year regardless of performance. In FY 2012, salary ranged from less than \$74,000 to \$276,000 (Office of Education Accountability, 2013). The data used in this study present a salary, ranging from \$56,632.80 to \$ 195,000 in SY 2003. However, the average salary levels of superintendents in rural Appalachian school districts are relatively lower than those in the other districts³⁰. In addition, several studies have found that the variation of salary is caused by the variation of school district sizes (e.g., Ehrenberg et al., 1988). Consequently, we may be concerned about the

²⁹ The residual that is “the portion of the variance in salary not accounted for by job size, human capital, personal characteristics, and past performance” contains “the assessment of managerial quality” (Meier and O’Toole, 2002, p. 633). To generate the residual-based measure, Meier and O’Toole predict superintendent salaries with 11 independent variables: district characteristics – district’s total budget, tax rate, average revenue per student; human-capital characteristics – experience as a superintendent, tenure in the current job, age, and the possession of doctorate; personal characteristics – gender, race, and ethnicity; and prior year’s test scores (pp. 634-635).

³⁰ Average Salary Levels of Superintendents (in \$1,000)

	Average Salary	S.D.	Min	Max
Rural Appalachian	89.13	12.09	39.05	109.40
Other	114.31	37.17	17.25	225.63

The *t*-test results show that there is a statistically significant difference between the two areas.

validity of the measure of salary as a proxy of managerial capability. Following Meier and O'Toole (2002), I used a measure based on the residual from a model explaining the superintendent's salary. Due to data limitations, I predicted the salary with 7 variables: district's total budget, average revenue per pupil, experience of a superintendent, tenure in the current job during the sample years, gender, race, and prior year's test scores. Also, I added a year indicator variable to reduce time-invariant effects and used the Consumer Price Index to control for inflation. The results of the salary model explain 80.6% of the variation in salaries. The objective of this approach is to "remove as many 'non-quality' factors from the superintendent's salary" as possible (Meier and O'Toole, 2002, p. 636). The regression residuals were then standardized for use in the following analysis.

Personnel Stability of a Superintendent

Personnel stability refers to constancy of the same individuals in an organization. In particular, personnel stability of top leadership (e.g., superintendent) is called managerial stability. For instance, O'Toole and Meier (2003) measure personnel stability of a superintendent by using the length of service of a superintendent of each school district. In this study, however, due to data limitations, stability was measured with a binary variable of whether a superintendent for the current school year is the same as in the previous school year. To be more specific, during the school years adopted in the paper, the length of service of some superintendents could be exactly computed but that of others could not be measured because the data do not provide accurate length of service. For instance, I can figure out the length of service of superintendents who started since SY 2002-3; however, it is impossible to precisely measure the length of service of certain superintendents whose position started before SY 2002-3. Instead, I created a

dichotomous variable measuring whether a certain superintendent's position continues consecutively. Accordingly, the variable takes on the value of 1 as long as the same superintendent is in the position as last year. Because personnel stability represents constancy or retention of the same individuals, it seems not to be a problem to use a dummy variable which was coded one if a certain superintendent serves consecutively in the same district (Hill, 2005).

School District Characteristics

Table 4.1 shows the descriptive statistics of the variables involved in the study. Superintendent's professional experience was measured by the number of years they have worked in Kentucky school districts. The average experience of superintendents is 28.26 years, ranging from 0 to 48 over all school districts. The average experience within the selected districts in the AMSP program is similar to that of all districts (28.96 years). The measure of district size is the total number of students enrolled in each district. The average district size of all districts is 15,114 students, ranging from 106 to 92,761, and the average district size of the selected districts (4,564 students) is smaller than that of all districts. For district's fiscal resources, an expenditure variable is measured by the adjusted spending per pupil per year in each district. The average adjusted spending per pupil is \$7,388 for all districts and \$7,453 for the selected districts.

Control Variables

Along with all the variables above involved in my theoretical framework, I also included some variables to control for the impacts of them based on the well-developed education production function (e.g., Hanushek, 1979). More specifically, fifteen measures of district and school characteristics are included as control variables in the

study: average years of principal and teacher experience, school size, school spending per pupil, student-teacher ratio, lagged average math and science test scores of each school, superintendent and principal gender, principal ethnicity, percentage of teachers with master's degrees per school, percentage of students enrolled in free or reduced-price lunch program per school, average teacher salary, school types, and each school year.

For each principal and teacher experience, an experience variable was measured by the number of years they worked in Kentucky school districts. The average experience of principals is 19.88 years, ranging from 0 to 52, and that of teachers is 11.75 years, ranging from 0 to 26 over all districts. The average experience within the selected district is 19.77 years and 12 years respectively. Professional experience is thought to improve organizational performance (e.g., Fiedler and Garcia, 1987). School principals have at least two roles, as leader and manager (e.g., Botha, 2004; Matthews and Crow, 2003). On one hand, the principal as instructional and administrative leader is required to collaborate with teachers to complete school goals for teaching and learning (Marks and Printy, 2003, p. 377). On the other hand, the principal as (middle) manager is responsible to improve the efficiency of the education production processes including implementation of funded programs (Hallinger, 1992). Accordingly, the principal's experience as educator and administrator may positively influence student achievement. Meanwhile, there have been mixed results in terms of the average years of teaching experience and average salary of teachers, so I controlled these factors.

The measure of school size is the average number of students enrolled in each school: 508 for all districts and 451 for the selected districts; the schools located in the districts participating in the AMSP program are smaller in terms of enrollment size. The

appropriate coefficient sign for school size is not clear. Some studies support the notion that school size has negative impacts on school performance, while several articles suggest moderating effects of socioeconomic factors on the size and performance relationship (e.g., Howley, 1996; Goddard et al., 2007).

For school spending, the measure is the adjusted spending per pupil per year in each school. The average is \$5,431 for the schools in all districts and \$5,347 for those in the selected districts. According to a large body of studies employing the education production function that is prevalingly used in studies on educational outcomes, school inputs such as investment, teacher quality, and professional preparation can significantly explain the variance of school performance (e.g., Ferguson, 1991; Greenwald et al., 1996). The extant literature on the impact of school spending on student achievement has identified significant and positive effects of school inputs (e.g., Fortune and O'Neil, 1994).

In terms of the student-teacher ratio, the measure is the number of students enrolled in each school divided by the number of teachers. The average ratio is around 15:1. Students spend a lot of time with their teachers as well as peers at school. Hence, pupil-teacher ratio would be an important proxy to tap the potential for academic and social interactions between students and their teachers (e.g., Cleveland-Innes and Emes, 2005; Parcel and Dufur, 2001). Better student-teacher ratios (i.e., a smaller number of students per teacher) may enhance learning by reducing “resources dilution effects in the classroom in terms of teacher attention to students” (Parcel and Dufur, 2001, p. 886). Many studies have found that lower pupil-teacher ratios are associated with higher student outcomes (e.g., Darling-Hammond, 2000; Houtenville and Conway, 2008).

The appropriate coefficient signs for individual characteristics such as gender (male = 1, female = 2) and ethnicity (1 = White, others = 2) are not clear. To control for students' ability regarding academic achievement, I added lagged math and science index scores. With regard to school characteristics, the free or reduced-price lunch program should be negatively associated with student achievement, while the percentage of teachers with a master's degree should be positively related to performance. Because the effects of these environmental factors may differ in each school type (1 = elementary, 2 = middle, 3 = high school), I controlled these school levels.

Table 4.1 Descriptive Statistics for AMSP School Districts

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
Student Achievement (z-score)	2006	-0.08	0.94	-2.95	3.61
Principal Participation	1857	0.25	0.43	0	1
Superintendent Capability (z-score)	1776	-0.42	0.19	-0.89	0.30
Superintendent Salary (in \$1,000)	2029	94.15	12.96	39.05	119.67
Superintendent Stability	2031	0.89	0.31	0	1
Superintendent Experience (year)	2029	28.96	8.70	0	48
District Spending (in \$1,000)	2031	7.45	0.72	5.97	11.56
District Enrollment (in 1,000 persons)	2031	4.56	2.69	0.39	10.45
Principal Experience (year)	1844	19.77	7.93	0	52
School Enrollment (in 100 persons)	2008	4.52	2.37	0.67	17.14
School Spending (in \$1,000)	1720	5.35	1.09	0.11	10.94
Student-Teacher Ratio	1993	15.20	2.09	7.40	23.80
Math Index (z-score, lag)	1993	-0.21	0.93	-3.56	3.33
Science Index (z-score, lag)	2004	-0.03	0.95	-2.79	3.65
Superintendent Gender (1 = male)	2029	1.16	0.36	1	2
Principal Gender (1 = male)	1845	1.59	0.49	1	2
Principal Ethnicity (1 = white)	2031	1.10	0.30	1	2
Masters Degree (%)	1730	77.70	16.06	0	100
Free Lunch (%)	1943	63.59	18.67	0	99.58
Teacher Experience (year)	1981	11.99	2.56	0.81	26
Teacher Salary (in \$1,000)	2031	38.96	1.81	33.41	47.95

Analysis and Results

Analysis

I used Stata software (version 13, Texas, USA) to conduct analyses using a two-way fixed effects regression approach that estimated the impacts of collaborative behaviors plus several explanatory variables representing school district characteristics on student achievement for the same schools at different points in time and in different districts. Doing this controlled time-invariant factors across districts and district-invariant factors that change over time, eliminating the key source of omitted variable bias.

Before analyzing the data using a fixed effects approach, I investigated whether the approach is appropriate for the data. First of all, to identify whether I needed to consider the characteristics (i.e., heterogeneity) of individual districts in my panel data, I conducted a joint hypothesis test of whether error terms across all individual districts equal zero. The result showed that the test statistic ($F = 2.19, p < .01$) was statistically significant at the 1% significance level, indicating that a fixed effects approach is more suitable in my data. Next, to decide between fixed or random effects approaches, I ran a Hausman test in which the null hypothesis is that the unique errors are not correlated with the regressors. The result showed that because the chi-squared test statistic ($\chi^2 = 77.59, p < .01$) was significant, the fixed effects approach would be better for this panel data set.

In order to see if time fixed effects were needed when employing a fixed effects approach, I ran a joint hypothesis test to investigate whether the dummies for all years are equal to zero. The result indicated that the F -test statistic ($F = 49.25, p < .01$) was significant, and thereby time fixed effects are needed in my case. Finally, I ran a test for panel-level heteroscedasticity, and the result indicated that there was heteroscedasticity

($\chi^2 = 994.79, p < .01$). As a result, I used heteroscedasticity-robust standard errors (aka, White or clustered standard errors). A serial correlation problem is not expected in micro panels (e.g., the time dimension is largely less than the individual dimension). This study deals with a micro panel, so this mitigates the likelihood of serial correlation.

Nevertheless, to confirm autocorrelation-free residuals, I conducted the Wooldridge test for serial correlations by regressing the residuals from my fixed effects model on its first lag and testing the coefficient on those lagged residuals. The results of this test ($\beta = -.058, p > .1$) revealed no serial correlation problems in my empirical models.

Results

Table 4.1 and Appendix D present descriptive statistics and a pairwise correlation matrix for the selected districts to the AMSP program. All values of VIFs were less than 10, and there are no significant correlations among independent variables (see Appendix D). In addition, when multiplicative terms are added to a regression model, I centered each relevant independent variable on its mean value, which may reduce the correlations between a linear variable and its squared term. Therefore, multicollinearity problems should not affect the results. Table 4.2 depicts the fixed effects panel regression estimates for student achievement. More specifically, model 1 introduces main effects plus control variables and model 2 includes quadratic and logarithmic terms to identify the nonlinear effects of a couple of explanatory variables that differ from the theoretical expectation. Then, model 3 is fully specified, including control variables, main effects, quadratic and logarithmic terms, and moderating effects. Appendix E shows descriptive statistics for school districts not participating the AMSP program, and Table 4.3 presents fixed effects panel regression estimates for those districts.

Collaborative Behavior and Performance

According to hypothesis 1, positive collaborative interactions are expected to positively influence organizational performance. Thus, I expected the coefficient estimate for collaborative behavior between entities in the public school system such as superintendents and their principals relative to student achievement to be positive and statistically significant. The fully specified model 3 in Table 4.2 supports this expectation ($\beta = .126, p < .1$) as collaborative interactions between them are found to relatively increase student test scores measured as organizational performance. More specifically, the standard deviation of standardized student achievement is 0.94, so the coefficient estimate is on average 0.126 standard deviation, which would shift students approximate 5 percentage points in the distribution (at most), e.g., from 50th to 55th percentile if a principal participates in the AMSP program. Therefore, hypothesis 1 is fully supported.

Managerial Capability and Economic Rewards and Performance

Hypothesis 2 (a) suggested that individual managers (i.e., district superintendents) with a high level of managerial capability play a key role in explaining variations in organization-level performance. I thus expected the coefficient estimate for managerial capability in model 1 to be positive and statistically significant. However, the coefficient estimate is insignificant though it demonstrates a positive sign. As O'Toole and Meier (1999, 2004b) suggested and examined, there could be nonlinear relationships between public management and performance which can be investigated by various interaction terms. Accordingly, I also investigated the possibility of a curvilinear relationship between managerial quality and student achievement by including log-transformed and squared terms for managerial quality, respectively. However, no evidence for nonlinear

effects was found. Therefore, hypothesis 2 is not supported with regard to linear and nonlinear effects³¹. In hypothesis 2 (b), the level of superintendent salary is expected to positively influence student academic achievement. Although the coefficient estimate demonstrates the expected sign, the effect of superintendent salary is not statistically significant. When I examined the nonlinear relationship between them, no evidence for nonlinear relationships was found. Hypothesis 2 (a) is not supported.

Managerial Stability and Professional Experience and Performance

I then tested hypothesis 3. Because I assumed that managerial stability measured by superintendent stability would be very closely related to the extent of expertise in problem solving and an adequate acquaintance with school systems, I expected the impact of superintendent stability to be positively and significantly associated with school performance. The main effect model 1 ($\beta = .180, p < .05$) and fully specified model 3 ($\beta = .170, p < .05$) in Table 4.2 support this expectation. In light of the mixed results of the extant studies, I also examined nonlinear relationships between superintendent stability and student achievement by including log-transformed and squared terms, respectively. However, there was no evidence for nonlinear effects.

In hypothesis 4, superintendents with professional experience were expected to positively influence student achievement. Like the impact of managerial stability, the coefficient estimates of superintendent experience demonstrated the expected sign in models 1 and 2. However, both estimates were not statistically significant, and so it is not

³¹ This approach that uses the residual from a model predicting the superintendent's salary is subject to a certain condition of competitive labor markets for superintendents (e.g., public school districts in Texas), in which "measures of program performance are available" (Meier and O'Toole, 2002). However, because the labor market for superintendents in Kentucky may be less competitive than urban areas in other states, it does not appear likely that the salary residual approach reflects well the managerial capability in Kentucky.

possible to say that the professional experience of district leaders positively influences student achievement. While I also examined the nonlinear effects of superintendent experience, there was no evidence for curvilinear relationships. As a result, hypothesis 4 is not supported.

School District Characteristics and Performance

Hypotheses 5 and 6 suggested that school district characteristics are related to student achievement. In particular, in hypothesis 5, I expected the estimated coefficient for district size to be negative and statistically significant. As expected, the specified model 3 in Table 4.2 showed that the effect of district size was negative and statistically significant ($\beta = -.284, p < .05$). Following Driscoll and colleagues (2003), I also examined the likelihood of nonlinear relationship between district size and student achievement, adding district size squared and log-transformed as an additional explanatory variable. However, no evidence for nonlinear relationships existed.

With regard to hypothesis 6 suggesting that fiscal resources from the school district are positively associated with student achievement, I expected that the estimated coefficient for district-level spending per pupil to be positive and statistically significant. Yet, in the main effect model 1, it was apparent that the linear relationship between district expenditure and student achievement was insignificant and negative, contrary to expectations. Following Moe (2009), I investigated the nonlinear relationships between district spending and school performance by including a quadratic term. As Table 4.2 indicates, the linear effect of district spending still demonstrates the negative sign, but it is not statistically significant. Meanwhile, the fully specified model 3 presents that there could be a nonlinear relationship (spending²: $\beta = .128, p < .05$), indicating that the

nonlinear effect is convex, and the quadratic and linear terms cancel out at the ratio 1.8 (linear coefficient/quadratic coefficient: $.232/.128$) and the curve may level off at the point of $.7$ (see Figure 4.2). This finding is an exception and hypothesis 6 was not supported.

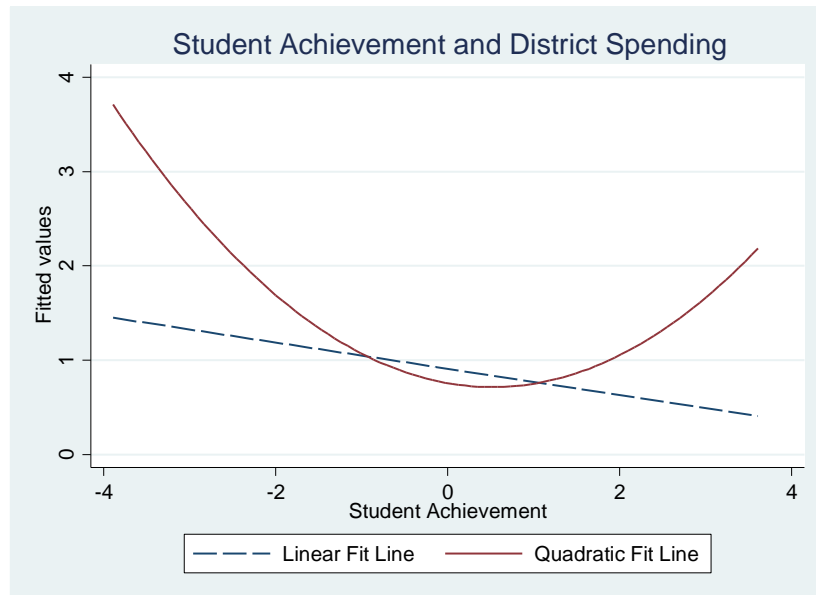


Figure 4.2 Nonlinear Relationships between Student Achievement and District Spending

Collaborative Behavior as Moderator

The level of collaboration between entities (i.e., superintendents and principals) is expected to differently influence school achievement. In addition, collaborative behaviors between them can offset or intensify the effects of other inputs such as district and school expenditure, principal and teacher attributes, and superintendent capability on student academic achievement. To examine this moderating role of principals' participation in the AMSP program, I introduced interaction terms of principals' participation on superintendent capability and economic rewards, district spending, principal experience, school spending, and teacher salary. As the full specified model 3 indicates, the

coefficient estimates of all interaction terms except the interaction term between participation and teacher salary are positive. Meanwhile, only two interaction terms between participation and superintendent salary ($\beta = .005, p < .1$) as well as participation and teacher salary ($\beta = -.045, p < .1$) are statistically significant. This finding suggests that the level of superintendent salary is more likely to positively influence student achievement when principals participated in the AMSP program than when they did not participate (see Figure 4.3). Teacher salary is negatively associated with student achievement and has a more negative effect when a school principal participates in the AMSP program than when the principal does not participate (see Figure 4.4).

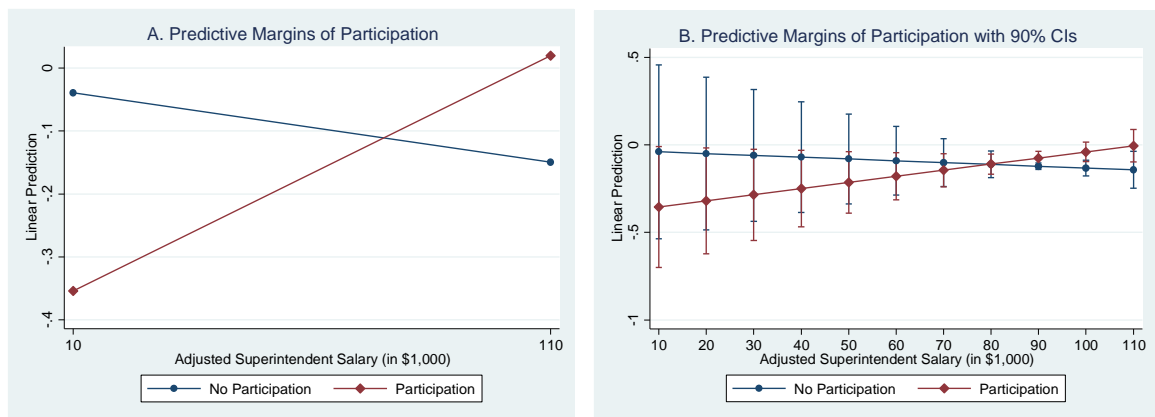


Figure 4.3 Interaction Effects Between Principal Participation and Superintendent Salary (A)

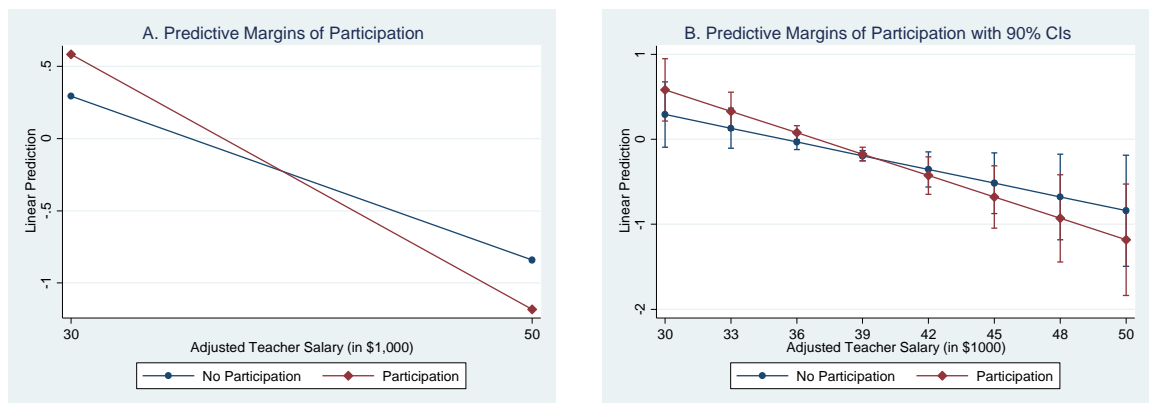


Figure 4.4 Interaction Effects Between Principal Participation and Teacher Salary

Table 4.2 Fixed Effects Panel Regression Estimates for Student Achievement (AMSP)

VARIABLES	Model 1: Main Effects	Model 2: Nonlinear Effects	Model 3: Moderating Effects
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Controls			
Math Index (lag)	0.289*** (0.0312)	0.289*** (0.0317)	0.291*** (0.0316)
Science Index (lag)	0.450*** (0.0340)	0.452*** (0.0328)	0.456*** (0.0336)
Superintendent Gender	0.0236 (0.0904)	0.0261 (0.0893)	0.0335 (0.0960)
Principal Gender	-0.00428 (0.0362)	-0.00923 (0.0364)	-0.0109 (0.0362)
Principal Ethnicity	-0.192 (0.174)	-0.198 (0.173)	-0.193 (0.182)
Master's Degree (%)	0.00342** (0.00158)	0.00368** (0.00161)	0.00368** (0.00157)
Free Lunch (%)	-0.00866*** (0.00137)	-0.00898*** (0.00134)	-0.00901*** (0.00138)
Teacher Experience	-0.00691 (0.00933)	-0.00822 (0.00906)	-0.00741 (0.00956)
Teacher Salary	-0.0542 (0.0413)	-0.0912** (0.0437)	-0.0809* (0.0451)
Principal Experience	-0.00367* (0.00185)	-0.00396** (0.00183)	-0.00462* (0.00241)
School Enrollment	-0.0291*** (0.0100)		
School Enrollment (log)		-0.143*** (0.0498)	-0.147*** (0.0501)
School Spending	0.0214 (0.0246)	0.0140 (0.0259)	0.0107 (0.0242)
Student-Teacher Ratio	-0.0134 (0.0113)	-0.0131 (0.0109)	-0.0132 (0.0109)
Constant	-3.180** (1.441)	-2.752** (1.358)	-2.737* (1.396)
Main Effects			
Principal Participation	0.0588** (0.0265)	0.0603** (0.0260)	0.126* (0.0630)
Superintendent Capability	0.511 (0.463)	0.444 (0.440)	0.388 (0.466)
Superintendent Salary	0.000446 (0.00306)	0.000661 (0.00318)	-0.00103 (0.00365)
Superintendent Stability	0.180** (0.0698)	0.162** (0.0629)	0.170** (0.0630)
Superintendent Experience	0.00293 (0.00545)	0.00292 (0.00541)	0.00347 (0.00533)

Table 4.2 (continued)

VARIABLES	Model 1: Main Effects Coefficient (SE)	Model 2: Nonlinear Effects Coefficient (SE)	Model 3: Moderating Effects Coefficient (SE)
Main Effects			
District Spending	-0.0600 (0.136)	-0.211 (0.141)	-0.232 (0.142)
District Spending (squared)		0.126** (0.0491)	0.128** (0.0498)
District Enrollment	-0.349*** (0.126)	-0.293** (0.120)	-0.284** (0.123)
Moderating Effects			
Participation x Sup. Capability			0.0655 (0.179)
Participation x Sup. Salary			0.00453* (0.00255)
Participation x District Spending			0.0424 (0.0523)
Participation x Principal Experience			0.00293 (0.00515)
Participation x School Spending			0.00341 (0.0430)
Participation x Teacher salary			-0.0451* (0.0233)
Observations	1,222	1,222	1,222
R-squared	0.562	0.566	0.569
Number of District	38	38	38
District FE	YES	YES	YES
Year FE	YES	YES	YES

Note: Dependent variable is the standardized composite index of math and science. The model was fixed on the year and the standard errors were clustered by district. Coefficients for the individual year dummies and other indicators are not reported. Robust standard errors in parentheses. Gender (male = 1, female = 2). *** $p < .01$, ** $p < .05$, * $p < 0.1$

Collaborative Behavior and Unilateral Behavior

Until now, I have investigated the effects of collaborative behavior between superintendents and principals and attributes of the school district organizations selected in the AMSP professional development program because the collaborative process is represented by this professional program. Accordingly, data were separated into two parts (i.e., participating or not participating in AMSP) in order to analyze collaborative behavior with regard to the AMSP program. Table 4.3 presents the regression coefficients for those two parts. As model 2 in Table 4.3 reveals, the effects of all school district attributes and principals' participation are not statistically significant, indicating that the effects of district-level characteristics on student achievement within school district organizations that did not participate in the AMSP program are insignificant. This is contrary to our expectations. In addition, the effect sizes are relatively smaller than those for the districts participating AMSP although the expected coefficient signs meet theoretical expectations. With regard to the interaction effect, the results suggest that the level of superintendent salary is more likely to negatively affect school performance when principals participate in the AMSP program than when they do not participate (see Figure 4.5).

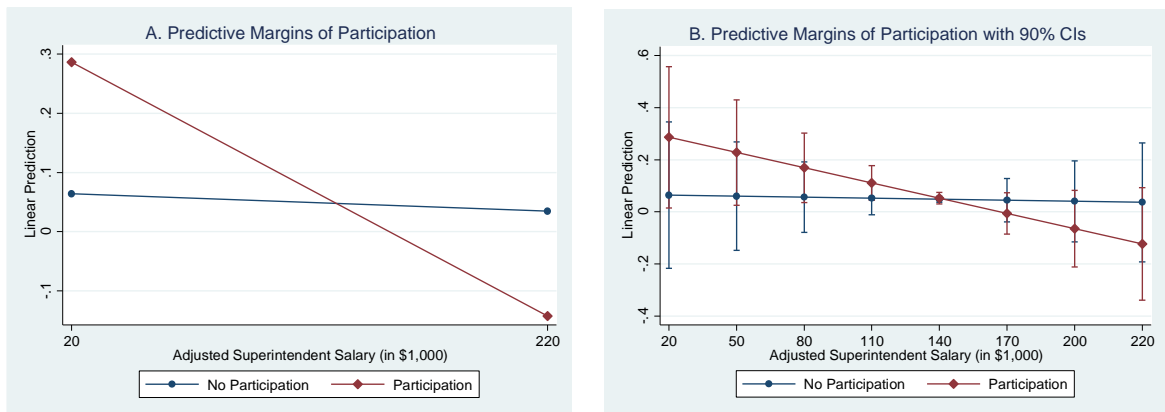


Figure 4.5 Interaction Effects Between Principal Participation and Superintendent Salary (B)

Table 4.3 Fixed Effects Panel Regression Estimates for Student Achievement

VARIABLES	Model 1. AMSP Participated Fixed Effects	Model 2. No AMSP Participated Fixed Effects
Main Effects		
Principal Participation	0.126* (0.0630)	0.0189 (0.0186)
Superintendent Capability	0.388 (0.466)	-0.0276 (0.132)
Superintendent Salary	-0.00103 (0.00365)	-0.000134 (0.00148)
Superintendent Stability	0.170** (0.0630)	0.0277 (0.0376)
Superintendent Experience	0.00347 (0.00533)	-6.15e-05 (0.00374)
District Spending	-0.232 (0.142)	0.0528 (0.0684)
District Spending (squared)	0.128** (0.0498)	-0.0155 (0.0126)
District Enrollment	-0.284** (0.123)	-0.00857 (0.0145)
Moderating Effects		
Participation x Sup. Capability	0.0655 (0.179)	0.0515 (0.0336)
Participation x Sup. Salary	0.00453* (0.00255)	-0.00181** (0.000861)
Participation x District Spending	0.0424 (0.0523)	0.0286 (0.0298)
Participation x Principal Experience	0.00293 (0.00515)	0.00159 (0.00199)
Participation x School Spending	0.00341 (0.0430)	-0.00847 (0.0209)
Participation x Teacher salary	-0.0451* (0.0233)	-0.00105 (0.0110)
Observations	1,222	4,037
R-squared	0.569	0.633
Number of District	38	138
District FE	YES	YES
Year FE	YES	YES

Note: Dependent variable is the standardized composite index of math and science. The model was fixed on the year and the standard errors were clustered by district. Coefficients for the control variables, the individual year dummies and other indicators are not reported. Robust standard errors in parentheses. *** $p < .01$, ** $p < .05$, * $p < 0.1$

Discussion and Conclusion

Collaboration and collaborative management have become central issues in the context of public administration. In particular, inter-organizational collaboration has been one of the most important topics in the public management field (Agranoff, 2012). However, little research has examined intra-organizational collaboration even though it has the potential to stimulate and provide new strategies by allowing collaborators to share professional knowledge and information, encourage employees to participate, and build social capital (e.g., Diamond and Rush, 2012; Huxham and Vangan, 2000). This article departs from such gap in the literature and investigated the effects of the collaborative interactions between superintendents and their principals on student academic achievement. In particular, results from two-way fixed-effects panel regression analyses supported the proposition that (positively) collaborative interactions between school leaders (i.e., superintendents and principals) would become one of the most important factors influencing student academic achievement in public education settings. This study also highlighted the moderating role of collaborative behaviors of school principals on the relationships between school resources and student achievement. It revealed that the effects of superintendent and teacher quality (as measured by salaries) on students' test scores vary depending on principals' participation in collaborative processes.

Research Implications

This article has a couple of important implications for public administration research. Most importantly, it demonstrates the importance of intra-organizational collaboration, especially in the arena of special-purpose government such as school

districts because their structures are different from those of general purpose local governments (Bryson, 2011; Meier and O'Toole, 2001). In addition, since this study employs a fixed-effects panel regression analysis, it can reduce the limitations of a cross-sectional analysis by which most of the extant research on collaboration in the public management field has examined its impacts.

In terms of theory, this study employs a general perspective of collaboration and a contingency leadership perspective to elaborate on inter-organizational collaboration in the public school setting. Extant studies have paid little attention to intra-organizational collaboration in public organizations. Furthermore, whereas some studies have examined the relationship between intra-organizational collaboration and organizational performance (e.g., Whitford et al., 2010), there is a lack of theoretical development. This study emphasizes contingency leadership to appropriately understand the effects of collaborative interactions within an organization. More specifically, mature leadership relationships between leaders and subordinates (e.g., superintendent-principal and principal-teacher) lead to effective leadership, and then followers may work harder to complete their jobs successfully and be more likely to exhibit higher levels of loyalty by building social capital, resulting in positive impacts on organizational performance (Uhl-Bien et al., 2000). In sum, the findings of this study show that intra-organizational collaboration has positive impacts on organizational performance in public organization settings.

In addition, this study suggests the possibility of nonlinear effects of public management on performance as discussed by O'Toole and Meier (1999, 2003). Those nonlinear relationships were examined by including log-transformed, squared, and

interaction terms in the model. Though it is a predictable result, the effects of superior salary on performance show nonlinearity when collaborative behaviors of middle managers (i.e., principals) are considered. That is, in general, the level of economic rewards of top management may be expected to contribute positively to performance, but the result from the data demonstrates a negative sign although the linear effect is insignificant. However, as Figure 4.3 indicates, superintendent's economic rewards are positively associated with student achievement (i.e., average marginal effects (AME) = .003) when principals participate in the AMSP program through collaborative behaviors, whereas economic rewards are negatively related to student achievement (AME = -.001) when principals do not participate, though these effects are insignificant. This finding indicates that the effects of superior salary vary depending on the subordinate's collaborative behavior. On the other hand, as shown in Figure 4.4, the effects of teacher salary are negatively associated with student achievement, and principal's participation offsets the effects by -.04 student achievement z-scores (No Participation AME = -.08, $p < .1$; Participation AME = -.12, $p < .05$), controlling for the percentage of teachers with master's degree, their experience, and overall spending. Thus, this result reflects higher spending from the budget on teachers of given backgrounds. Though some studies have found a negative effect of teacher salary on student achievement (e.g., Borland and Howsen, 1996; Hanushek, 1986), the finding of this study is unexpected. Nevertheless, this result can be partially explained by findings that suggest that teachers unions can not only raise teacher salary, but also reduce student academic achievement (e.g., Kingdon and Teal, 2010), indicating that when there would be significant conflicts between principals and teachers, principal's collaborative

leadership and behaviors may not much influence teacher's perception and behaviors with regard to student achievement. In addition, this finding suggests the importance of conflict management to complete collaborative processes successfully. Another possible explanation is that the Kentucky Education Reform Act (KERA) of 1990 raised teacher salaries in Appalachian schools, especially for teachers of low and medium experience; furthermore, KERA equalized salaries across Appalachian and non-Appalachian school districts for teachers of high experience (Streams et al., 2011), which may result in negative relationships between teacher wages and student achievement in the Appalachian region. Also, we can assume the possibility that teachers in Appalachian schools in which principals participated in the AMSP program could be less effective, thus the interaction effect of principals' participation and teacher salary became negative.

With regard to research methodology, many scholars in the public management field have pointed out that cross-sectional data analysis with a retrospective perception of collaborative processes has a limited ability to identify a causal relationship (O'Leary and Vij, 2012). Most of the extant research on collaboration in public management (Agranoff and McGuire, 1998; McGuire and Silva, 2010; Whitford et al., 2010) has employed cross-sectional analysis using data from a single, one-time survey sample, highlighting the limitation of determining causality. Instead, they assume one-way causality from collaboration and its outcomes and linear relationships between them. On the other hand, this study employs a time and district fixed-effects panel regression approach by which it can examine a reverse causal direction³², controlling time- and district-invariant factors which may reduce, but does not completely eliminate, bias from omitted variables.

³² The impact of a reverse causal direct (i.e., lagged performance influences principal participation) is positive but statistically insignificant ($\beta = .036, p > 0.1$).

Practical Implications

There are two important implications for public administration policy and practice. One is that this study explicitly supports the proposition that collaborative interactions and behaviors within an organization or a set of sub-units positively influence organizational performance. In the public management field, a paradigm shift has taken place from intra-organizational collaboration to inter-organizational collaboration (i.e., collaborative public management). According to Agranoff (2006, p. 57), however, most managers in public organizations spend most of their time working with their organizations and only 15 to 20 percent of their total work time in inter-organizational collaborative activities. Consequently, internal collaboration and collaborative behaviors are as important as inter-organizational collaboration in the arena of public management, especially in special-purpose government agencies such as public schools. In addition, from a school-level standpoint, the effects of internal and external resources such as fiscal expenditure, individual's attitudes and characteristics, and entities' characteristics vary depending on the collaborative behaviors of middle managers (i.e., principals). Accordingly, while I would emphasize the need for more in-depth and comprehensive research on those nonlinear effects, leaders and managers can establish, change, and adopt strategies for collaboration and collaborative behaviors for a certain situation.

The other implication is only for school district organizations. Until recently, existing literature has paid little attention to how districts and district leadership make an impact on student achievement. Waters and Marzano (2006) suggest the importance of district-level leadership for student achievement by conducting a meta-analysis with 27

studies since 1970. Actually, the data used in this article also demonstrate the positive and significant effect of superintendent stability, which is significantly associated with leadership, on student academic achievement. This result provides evidence supporting the arguments of O'Toole and Meier (2003; a positive effect of stability) and Alsbury (2008; a negative effect of turnover). In the state of Kentucky, the superintendent is hired for a term of no more than 4 years (KRS 160.350(1)), and then the school board can annually add a year of employment to his or her contract (KRS 160.350(4)). Therefore, we can explore guideline recommendations about an optimal employment term depending on various situations such as regional location, superintendent experience, extra roles, and so on. Finally, there is controversy about which size is appropriate for school districts; that is, some researchers suggest economies of size that emphasize efficiency of district consolidation (e.g., Andrews et al., 2002), while others suggest smaller district to provide better communication and improve accountability (e.g., Driscoll et al., 2003). The data from this study demonstrate the significant negative effect of larger district size on student achievement. Thus, this result indicates that we may need smaller school districts, although, of course, we need further comprehensive studies because there is the possibility of indirect effects of district characteristics on student achievement (e.g., Bidwell and Kasarda, 1975). Furthermore, Howley (1996) investigated interacting effects between the socioeconomic status (SES) of districts and district size on student achievement and found that the effect of district size varies depending on SES. For instance, the effects of size on achievement are positive for the affluent and negative for the impoverished.

Limitations and Further Research

Despite its contributions, this study has several drawbacks that need to be addressed. First of all, even though the findings from the study support the theoretical expectation, no single sample can be taken to be representative of the multifaceted dimensions of public management contexts. More specifically, this study focuses mainly on collaboration and collaborative behavior within an organization to identify internal collaborative interactions that help the organization survive by improving its performance. It is based on specific settings, namely, school districts in Kentucky, which is only one of many public management arenas. School districts are special-purpose and professionalized government agencies (Meier and O'Toole, 2001), and teachers have a great deal of autonomy (Meyer and Baker, 1996). Hence, the findings from this research should be applicable to other public organizations that are identically or similarly structured. Therefore, further research should be conducted in various settings (e.g., federal and state government, healthcare agencies, etc.) for generalizability of findings.

For measures, because performance inherently has multiple dimensions, a wide range of performance measures have been employed. In particular, performance measures of students (e.g., standardized test scores, attendance rates, dropout rates; Rumberger and Palardy, 2005) have been widely used in assessing the effectiveness or outcomes of educational policy and practice (e.g., Hanushek, 1986; O'Toole and Meier, 2003). This study focused on students' test scores as school performance such that the marginal effect of collaborative behavior may appear to reflect a program effect of participating in AMSP. However, the marginal effect can only explain limited portion of the effect for the AMSP program because the program effect of AMSP can be accurately calculated by

taking into account both teachers' participation in AMSP and the test scores of their students. Furthermore, we should be careful when interpreting the effect of test scores as a program effect due to the ecological fallacy problem. Meanwhile, we can consider other factors such as, for example, overall academic achievement (i.e., academic index scores), education accountability (i.e., accountability index scores), and dropout rates as the measures of organizational performance.³³ The results from the data show the effects of collaborative behavior between superintendents and their principals on those measures (see Appendix F). For instance, the coefficient estimates of principals' participation with regard to overall academic index scores and accountability index scores are positive and statistically significant. However, the effect of collaborative behavior on dropout rates has a negative sign as expected but is insignificant. For more in-depth and comprehensive research on the relationships between collaborative behavior and different performance measures, further research is recommended to carefully investigate those relationships.

Because there is no consensus on competing definitions of collaboration, it is difficult to appropriately measure collaboration. Thus, the development of an accurate measure of collaboration is a significant issue that should be solved (e.g., O'Leary and Vij, 2012). Most of the extant research has conducted surveys to measure collaboration because at least one of the dimensions of collaboration should include reciprocal interactions between participating entities and researchers may need respondent's responses to relevant questions. Furthermore, with regard to internal collaboration, the

³³ "Accountability index scores are calculated annually for each school and school district in the state and derive in part from tests administered to fourth, eighth, and twelfth graders and in part from noncognitive criteria, including attendance, retention, dropout, and transition to adult life" (Reeves, 1998, p. 5). Overall academic index scores include scores for reading, math, social studies, science, writing, arts and humanities, and practical living/vocational studies (Cowley and Meehan, 2002, p. 3).

dimension of affective relations between leaders and members is a key factor to understand the working mechanism of collaboration (Scott and Bruce, 1994). In this study, collaborative behavior was measured by the actual activity based on a specific shared goal – development of and participation in a certain professional development program – rather than by respondents’ perceptions of collaboration in order to capture an objective measure. Nevertheless, this study was limited to accurately measure collaboration because this measure may not capture different types and extents of collaboration (see O’Leary and Vij, 2012, p. 11). Thus, further research should develop measures for collaboration or collaborative behavior based on either perception, a specific indicator, or a mixed measure of collaboration to strengthen empirical validation.

In addition, Agranoff and McGuire (1998) suggest the possibility of political power behind the rhetoric of collaboration and embedded trust. They assert that “power would appear to be a substitute for trust in ensuring predictability in collaborative efforts” (p. 89), indicating that power may influence directly and indirectly those reciprocal relationships as well as trust itself. For instance, some researchers suggest a mediating role of teachers in the relationship between school leadership and student achievement (e.g., Hallinger and Heck, 1998). Teachers unions could also negatively influence student achievement (Kingdon and Teal, 2010), suggesting that power (or conflict) is likely to play a role as a moderator or mediator. Thus, further studies should examine power and its directions to fully understand the collaborative process.

Finally, some researchers have suggested an examination of nonlinear effects of public management on its outcomes to appropriately understand their relationships (e.g., O’Toole and Meier, 1999). For instance, Fiedler and Garcia (1987) investigated the

relationship between leader's cognitive resources (i.e., experience and intelligence) and group performance and found moderating effects of interpersonal stress acting on the relationship; that is, leader's experience may contribute to better group performance only when interpersonal stress is high compared to when it is low. Therefore, future researchers should consider the possibility of nonlinear effects as well as linear relationships of public management including collaborative behavior and employ various research methods to identify and investigate unknown causal mechanisms.

Concluding Remarks

This study has explored the linear and nonlinear effects of internal and external organizational environments on organizational performance from a school-level standpoint. The proposed theoretical framework contributes to the theoretical foundation of collaborative management and human resource management research in the field of public administration, particularly in terms of public school districts. Furthermore, the statistical results indicate that collaborative behaviors between leaders and subordinates and various public management and resources such as superintendent stability and district expenditure exhibit linear and nonlinear effects on school performance. In addition, the findings present important theoretical and practical implications. The most important finding of this study is the linear effect and the moderating role of collaborative behavior. In light of the lack of research on collaboration in the public management field, this study provides a foundation for further research endeavors. For practitioners, this research shows the possibility that managerial activities may have varying effects at different levels of environment.

Chapter Five

Conclusion, Implications, and Limitations

This dissertation encompasses empirical and theoretical studies that explore the motivation of public servants as well as an empirical study of collaborative behavior in the public education setting. Chapter Two reviews the extant literature regarding PSM. Previous literature has not yet confirmed whether there is a direct and actual impact of PSM on its outcomes; that is, there have been mixed empirical results and unclear causality between PSM and a number of constructs. Consequently, Chapter Two conducts a meta-analytical structural equation analysis with regard to the relationships among PSM, value fit, individual work attitudes, and individual performance in order to better understand their association and provide a possible solution for conflicting empirical findings through computing average effect sizes in terms of those components and showing the big picture of their relationships. There were partial mediation effects of key variables such as person-organization fit, job satisfaction, and organizational commitment on the PSM-performance relationship. It would be worth identifying these mediating effects because previous researchers have alleged that job satisfaction and organizational commitment are antecedents of performance, and PSM has been considered as an antecedent to those work attitudes.

Drawing on these findings, Chapter Three theoretically explores the relationship between PSM and individual- and group-level performance by suggesting a conceptual framework in which social networks among work group members provide an explicit mechanism linking employees' PSM with their performance and by proposing four empirically testable propositions. Conceptually, this dissertation suggests that (1) the

extent of the social relationships among group members and their positions within a network vary depending on the level of PSM; (2) individuals' PMS has an indirect positive effect on their performance through its influence on their central positions in a social network of advice relations and has no significant effect on their performance in a network of adversarial relations if their central positions in the network mediate the PSM-performance relationship; (3) group-level PMS has an indirect positive effect on group performance through its influence on the density of a social network of advice relations and has no significant effect on group performance in a network of adversarial relations if the density of the network mediate the PSM-performance relationship.

Chapter Four attempts to answer the question of whether collaborative behavior between district superintendents and school principals as well as certain managerial capacities influence school-level student academic achievement, using a data set from the state of Kentucky. Although the importance of collaboration among various actors has been highlighted due to the growing complexity of societal problems, the extant literature has focused on the linear impacts of the characteristics and leadership styles of district and school leaders themselves on school outcomes. In addition, little attention has been paid to collaborative behavior of public officials within their organizations or within their groups. Chapter Four finds that collaborative behavior between district and school leaders has a positive and significant linear impact on student achievement and differential/moderating effects with regard to economic rewards of superintendents and teachers.

Implications

Public management research helps to explain the variations of government effectiveness through examining various management activities, such as how to enhance the motivation of public servants to deliver better quality service and which management strategies (e.g., collaborative interaction) are successful in managing public organizations. In this respect, the findings of this dissertation provide several theoretical and practical implications. Chapters Two and Three start from suspicion that the causal mechanism between PSM and its outcomes has not been fully specified. Accordingly, this dissertation represents an important first step toward understanding this complicated mechanism by conceptualizing a reciprocal relationship between PSM and the interaction patterns among individuals themselves or individuals and work circumstance (e.g., their organizations). Mediating roles of P-O fit and social networks on the PSM-performance relationship are explained empirically and theoretically. This result may enable us to address the big picture issue of the relationship. In addition, the findings of meta-analytic structural equation analyses from the second chapter account for the extant conflicting results by showing the overall effect size of each component of the PSM-related relationships. Along with an empirical analysis, Chapter Four also attempts to provide theoretical background for collaboration between superiors and subordinates within public organizations by employing two perspectives of collaboration and contingency leadership. In light of the lack of research on this topic, identifying a theoretical mechanism of intra-organizational collaboration in public organizations is a valuable contribution of this dissertation.

The findings of this dissertation offer useful suggestions to managers and practitioners in the public sector. In Chapter Two, PSM is shown to positively influence work attributes and individual performance via some moderators. This indicates a reciprocal relationship between PSM and P-O fit which implies that both help to foster positive relationships. Thus, it may be necessary to enhance the matching values of public servants and their organizations to promote PSM, and public managers and practitioners can take PSM into account as a criterion for public human resource management. The results from the fourth chapter in this dissertation explicitly support that collaborative interactions and behaviors between superiors and subordinates within an organization or a set of sub-units positively influence organizational performance. Therefore, in the public education setting, it should be emphasized that district-level leadership is also an important exogenous variable to improve student achievement, and specific guideline recommendations about superintendent employment need in order to maximize superintendents' managerial capacity.

Limitations and Future Research

Despite its contributions, this dissertation has several key limitations that suggest fruitful avenues for future research. First, a meta-analysis could be constrained by the research questions researchers choose to examine, the limited description of research settings they use, and the methodological quality of the original articles. For instance, most of the studies contained in the meta-analysis of this dissertation have the possibility of common method bias which may make the relationships between the explanatory and response variables spurious. Thus, this dissertation may be limited in its identification of the true effects of correlations available in the original studies. In addition, most studies

included in the meta-analysis use cross-sectional data that cannot address the causality issue (i.e., reverse causality) between variables. Accordingly, future researchers should use data collected at different points in time or by randomized and controlled experiments to establish a causal relationship and strengthen external validity.

Second, the testable propositions suggested in the third chapter are based on the structural perspectives of a network of relations. This approach to networks may ignore relationship qualities embedded in the networks and thus inadequately identify how networks function. Therefore, future researchers should theorize about the causal mechanism of content factors within networks and calculate relationship qualities related to the network-performance link in order to examine the full impacts of the factors on the outcomes of individuals' trust, belief, and behavior in a network of relations. It is expected that the relationship between PSM and performance varies depending on the level of relationship qualities (e.g., trust, commitment).

Finally, the fourth chapter focuses mainly on collaboration and collaborative behavior within an organization in a specific setting, namely, school districts in Kentucky. This is only one of many public management arenas. In order to increase generalizability, the findings from this dissertation should be applicable to other public organizations; accordingly, further research needs to be conducted in various settings (e.g., federal and state government, healthcare agencies, etc.). In addition, this dissertation measured collaborative behavior as an actual activity based on a specific shared goal rather than as respondents' perceptions of collaboration. This approach has some limitations in that this measure may or may not capture different types and extents of collaboration. Agranoff and McGuire (1998) point out the possibility of political

power behind the rhetoric of collaboration that may directly and indirectly influence reciprocal relationships including trust; in other words, power (or conflict) can serve as a moderator or mediator. Thus, future researchers should develop measures for collaboration (collaborative behavior) based on perception, a specific indicator, or a mixed measure of collaboration to strengthen empirical validation. In addition, future studies may need to examine power and its directions in order to fully understand the collaborative process.

Appendix A
Meta-Analytic Correlation Matrix

	PSM	JS	OC	POF	PER	GEN	AGE
PSM	1 (.76)						
JS	.234 (N,Sample size) (68, 421,372)	1 (.79)					
OC	.375 (N,Sample size) (36, 78,915)	.573 (18, 62,115)	1 (.77)				
POF	.364 (N,Sample size) (8, 3,244)	.579 (6, 2,240)	.608 (1, 814)	1 (.88)			
PER	.189 (N,Sample size) (11, 37,521)	.370 (6, 20,278)	.370 (4, 18,572)	.377 (1, 205)	1 (.85)		
GEN	-.008 (N,Sample size) (36, 125,814)	-.006 (33, 122,667)	-.020 (11, 43,879)	-.036 (4, 1,349)	-.026 (4, 18,019)	1 (1.00)	
AGE	.071 (N,Sample size) (43, 128,175)	.045 (38, 123,927)	.062 (13, 43,602)	.028 (3, 1,041)	-.031 (4, 18,019)	-.090 (34, 125,026)	1 (1.00)

Note: PSM = public service motivation; JS = job satisfaction; OC = organizational commitment; POF = person-organization fit; PER = performance; GEN = gender (female = 1, male = 0); AGE = age. The first entry in each cell is the average correlation for that pair of variables. Entries in parentheses are the number of estimates (samples) and observations (total sample sizes). Cronbach's alpha is provided in parentheses. Harmonic mean = 2,354.

Appendix B
Procedure for Testing for Mediation via Structural Equation Models

1. To test for mediation, fit one model via SEM, so the direct and indirect paths are fit simultaneously so as to estimate either effect while partialling out, or statistically controlling for, the other.
 - a. “Some” mediation is indicated when both of the $X \rightarrow M$ and $M \rightarrow Y$ coefficients are significant.
 - b. If either one is not significant (or if both are not significant), there is no mediation, and the researcher should stop.
2. Compute the z to test explicitly the relative sizes of the indirect (mediated) vs. direct paths. Conclusions hold as follows:
 - a. If the z is significant and the direct path $X \rightarrow Y$ is not, then the mediation is complete.
 - b. If both the z and the direct path $X \rightarrow Y$ are significant, then the mediation is “partial” (with a significantly larger portion of the variance in Y due to X being explained via the indirect than direct path).
 - c. If the z is not significant but the direct path $X \rightarrow Y$ is (and recall that the indirect, mediated path, $X \rightarrow M$, $M \rightarrow Y$ is significant, or we would have ceased the analysis already), then the mediation is “partial” (with statistically comparable sizes for the indirect and direct paths), in the presence of a direct effect.
 - d. If neither the z nor the direct path $X \rightarrow Y$ is significant, then the mediation is “partial” (with statistically comparable sizes for the indirect and direct paths), in the absence of a direct effect.
3. The researcher can report the results:
 - a. Categorically: “no,” “partial,” or “full” mediation,
 - b. As a “proportion of mediation” (in the variance of Y explained by X): $\frac{\hat{a} \times \hat{b}}{(\hat{a} \times \hat{b}) + \hat{c}}$,
 - c. Or comparably, as the ratio of the “indirect effect” to the “total effect.”
4. Each construct should be measured with three or more indicator variables.
5. The central trivariate mediation should acknowledge the possibility of rival models, and test several, at least $Y \rightarrow M \rightarrow X$, and something like $M \rightarrow X \rightarrow Y$. Ideally these rivals would be fit with Q in order to have diagnostic fit statistics. However, alternative models should be run even with only X , M , and Y , and the researcher should be able to argue against the different parameter estimates as being less meaningful than their preferred model.

Source: Adopted from Iacobucci et al. (2007, p. 153)

Note: Number 4 is not available in the current study because this study was conducted using meta-analysis.

Appendix C
 Estimates of Structural Relationships for the Competing Model (PER → PSM)

Effect	Standardized Direct Effect / <i>t</i> -statistic
PER → PSM	.053 / 2.219 **
PER → Job Satisfaction	.154 / 8.523 ***
Total effect:	.322 / 18.207 ***
PER → Organizational Commitment	.133 / 7.538 ***
Total effect:	.318 / 17.867 ***
PER → PO fit	.356 / 17.169 ***
Total effect:	.351 / 20.035 ***

Note: Entries separated by slashes are standardized direct effect on the left and *t*-statistics on the right. When there are no mediating variables, direct effects equal total effects. Model fit: $\chi^2 = 172.262$ (*d.f.* = 6, $p < .01$), RMSEA = .108 ($p < .01$), CFI = .950, SRMR = .060, AIC = 436636.734. *** $p < .01$, ** $p < .05$, * $p < .1$.

Appendix D
Correlation Coefficient Matrix for the AMSP School Districts

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Student Achievement	1																					
2. Participation	0.02	1																				
3. Sup. Capability	0.40	0.04	1																			
4. Sup. Salary	0.17	-0.03	0.35	1																		
5. Sup. Stability	-0.01	0.00	-0.09	0.09	1																	
6. Sup. Experience	0.02	0.04	0.51	0.22	0.23	1																
7. Dist. Spending	-0.17	0.12	-0.15	-0.28	0.01	0.04	1															
8. Dist. Enrollment	0.12	-0.04	0.59	0.52	-0.03	0.26	-0.30	1														
9. Prin. Experience	-0.07	0.06	0.00	0.04	-0.01	-0.01	-0.09	0.11	1													
10. School Enrollment	-0.03	0.01	0.07	0.21	0.01	-0.05	-0.24	0.17	0.07	1												
11. School Spending	0.01	0.08	-0.06	-0.07	0.03	-0.04	0.32	-0.09	-0.01	-0.39	1											
12. S-T Ratio	0.02	-0.07	0.05	0.09	0.00	-0.03	-0.25	0.07	-0.07	0.40	-0.56	1										
13. Math (lag)	0.70	0.00	0.39	0.17	-0.01	0.01	-0.20	0.10	-0.06	0.00	-0.04	0.04	1									
14. Science (lag)	0.74	0.03	0.40	0.13	0.00	0.01	-0.17	0.11	-0.02	-0.02	-0.03	0.02	0.66	1								
15. Sup. Gender	-0.11	0.06	-0.27	-0.16	-0.14	-0.26	0.04	-0.15	-0.02	-0.04	0.05	-0.06	-0.07	-0.09	1							
16. Prin. Gender	0.02	0.02	0.01	0.04	0.01	0.01	0.10	0.02	-0.09	0.10	0.02	0.03	-0.03	0.02	-0.09	1						
17. Prin. Ethnicity	-0.02	0.17	0.00	-0.04	0.02	0.00	0.04	0.01	0.02	-0.08	-0.02	-0.02	-0.03	0.01	-0.04	-0.13	1					
18. Masters Degree	0.09	0.08	0.06	-0.17	-0.02	-0.08	0.11	-0.12	-0.01	0.03	0.09	-0.03	0.03	0.06	0.02	0.09	-0.17	1				
19. Free Lunch	-0.23	0.05	-0.09	-0.24	0.06	0.06	0.48	-0.16	-0.07	-0.44	0.32	-0.35	-0.27	-0.19	-0.08	-0.01	-0.01	0.06	1			
20. Teacher Experience	0.05	0.07	0.04	-0.18	-0.02	0.04	0.09	-0.14	-0.04	-0.08	-0.01	0.03	0.03	0.06	-0.09	0.08	0.10	0.44	0.03	1		
21. Teacher Salary	0.13	0.03	0.34	0.00	-0.04	0.09	0.30	0.13	0.01	-0.04	0.03	0.02	0.06	0.13	-0.15	0.13	0.08	0.23	0.11	0.32	1	

Appendix E
Descriptive Statistics for No AMSP School Districts

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
Student Achievement (z-score)	6553	0.03	1.01	-3.89	3.58
Principal Participation	6291	0.26	0.44	0	1
Superintendent Capability (z-score)	5900	0.13	1.11	-1.05	3.29
Superintendent Salary (in \$1,000)	6633	118.16	39.48	17.25	225.63
Superintendent Stability	6657	0.85	0.35	0	1
Superintendent Experience (year)	6625	28.05	7.38	0	46
District Spending (in \$1,000)	6651	7.37	1.02	5.55	12.22
District Enrollment (in 1,000 persons)	6649	18.34	30.01	0.11	92.76
Principal Experience (year)	6357	19.91	7.72	0	45
School Enrollment (in 100 persons)	6568	5.25	2.96	0.53	21.26
School Spending (in \$1,000)	5618	5.46	1.44	0.11	12.82
Student-Teacher Ratio	6549	15.98	2.55	5	27
Math Index (z-score, lag)	6486	0.06	1.00	-3.08	4.19
Science Index (z-score, lag)	6566	0.01	1.01	-3.80	4.64
Superintendent Gender (1 = male)	6646	1.11	0.31	1	2
Principal Gender (1 = male)	6355	1.52	0.50	1	2
Principal Ethnicity (1 = white)	6660	1.11	0.31	1	2
Master's Degree (%)	5641	76.27	14.05	0	100
Free Lunch (%)	6352	50.89	21.99	0	99.62
Teacher Experience (year)	6511	11.68	2.55	0	26
Teacher Salary (in \$1,000)	6651	40.06	3.16	28.40	51.22

Appendix F
Fixed Effects Panel Regression Estimates for Academic Index, Accountability Index, and
Dropout Rates

VARIABLES	Model 1: Academic Index	Model 2: Accountability Index	Model 3: Dropout Rates
Principal Participation	0.0670** (0.0263)	0.0595** (0.0258)	-0.0690 (0.0856)
Superintendent Capability	2.514*** (0.424)	5.630*** (0.990)	-0.244 (0.802)
Superintendent Salary	-0.00158 (0.00331)	-0.0117** (0.00538)	-0.00116 (0.00205)
Superintendent Stability	0.333*** (0.0817)	0.269*** (0.0860)	-0.134 (0.0954)
Superintendent Experience	-0.0130** (0.00621)	-0.0525*** (0.0108)	0.00358 (0.00586)
District Spending	-0.211 (0.149)	0.229* (0.114)	0.213 (0.167)
District Spending (squared)	0.125** (0.0488)	0.00409 (0.0325)	-0.0485 (0.0852)
District Enrollment	-0.259* (0.134)	-0.258** (0.106)	0.277 (0.180)
Constant	-1.499 (1.498)	0.101 (1.370)	3.132 (1.982)
Observations	1,220	977	1,222
R-squared	0.563	0.610	0.740
Number of dist_code	38	38	38
District FE	YES	YES	YES
Year FE	YES	YES	YES

Note: Dependent variables are total academic index score, accountability index score, and dropout rates. The model was fixed on the year and the standard errors were clustered by district. Coefficients for the control variables, the individual year dummies and other indicators are not reported. Robust standard errors in parentheses. *** $p < .01$, ** $p < .05$, * $p < 0.1$

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