The Effects of Knowledge Sharing on Program Performance: Influences on CPS Program Performance

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(Abstract)

As current social problems grow more complex, public organizations have to deal with more complicated problems and values than in the past. Public organizations arguably need more knowledge to effectively address such complex problems. However, there is little study of the relationship between knowledge sharing and government performance. This study has several primary purposes. First, it tries to find out more about the roles and effects of knowledge sharing on program performance in public organizations. Second, by examining the factors affecting the relationships between knowledge sharing and program performance, the study explores the importance of individual and organizational conditions in connecting knowledge sharing to program performance. Lastly, the study helps clarify the effect of knowledge sharing on program performance by also examining other factors that are likely to affect program performance.

To explore the relationships among explicit and tacit knowledge sharing, public service motivation, self-set goals, red tape, economic conditions, staffers' professionalism, budgetary resources, and program performance, I examined Virginia's Child Protective Services program. The Virginia Department of Social Services determines the guidelines and policies for the state's CPS program and supervises its implementation by local agencies. I focused on the implementation of the CPS program. The study examined the relationships between CPS program performance and the degree and dynamics of knowledge sharing at the local jurisdictional and at the individual social worker levels in each of the 23 local CPS departments in which staffers responded to an on-line survey. In addition to these relationships, the study examined the effects of individual, organizational, and financial factors in Virginia local CPS departments on the relationships between knowledge sharing and program performance.

The study yielded numerous findings. First, at the local agency level evidence showed that explicit knowledge sharing played an important role in affecting CPS program performance. At the individual level, only the reported usefulness of explicit knowledge sharing affected CPS program performance, while the usefulness of tacit knowledge sharing and time devoted to explicit knowledge sharing affected usefulness of explicit knowledge sharing. The personal motivation of CPS staffers influenced program performance through tacit knowledge sharing, and red tape evidently affected CPS program performance by decreasing explicit and tacit knowledge sharing. Even when factors like local economic conditions and available financial

resources were taken into account, the usefulness of explicit knowledge sharing still affected CPS program performance. Second, the relationships among time devoted to, usefulness of, and access to explicit and tacit knowledge sharing were diverse. They affected CPS program performance through the reported usefulness of explicit and tacit knowledge sharing. Third, individual and organizational factors influenced the relationship between knowledge sharing and CPS program performance. The personal motivation of CPS staffers had a positive effect on tacit knowledge sharing, but red tape appeared to have a negative effect on explicit and tacit knowledge sharing. Fourth, the study showed that several factors other than knowledge sharing such as local economic conditions, work training of CPS staffers, family assessments, CPS staffer education, and additional budgetary resources also affected CPS program performance.

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CHAPTER 1 Introduction

Knowledge management is a popular issue in the private sector (Jennex, 2007), where knowledge is regarded as one of the critical assets in organizations (Argote, McEvily, and Reagans, 2003). Jennex and Zyngier (2007, p. 493) define knowledge management as "the capturing of the knowledge from past decision-making for application to current decision-making with the express purpose of improving organizational performance." Many scholars have been interested in the effect of knowledge on the performance of private organizations.

Unlike the private sector, however, it is hard to find scholarly research on knowledge management in the public and non-profit sectors (Willem and Buelens, 2007). As current social problems grow more complex, public organizations have to deal with more complicated problems and values than in the past. Public organizations arguably need more knowledge to effectively address such complex problems. In other words, many public organizations need to play roles as "knowledge-intensive" organizations (Willem and Buelens, 2007, p. 582). One of the important elements in knowledge management is *knowledge sharing,* which can be defined as "the exchange of knowledge between and among individuals and within and among teams, organizational units, and organizations" (King, 2006, p. 493). Yet, there is little study of the relationship between knowledge sharing and government performance.

1.1. Purpose of the study

Program performance is a popular and important subject to study in the public sector. From many perspectives, scholars have looked for ways to achieve more effective performance.

The use of knowledge is regarded as an important way to accomplish better organizational performance and effectiveness in modern society. As already noted, studies about knowledge have been popular in the private sector. The topics are various, such as knowledge management, knowledge sharing, knowledge transfer, and knowledge creation.

Even though there is an increasing emphasis on the importance of knowledge sharing for organizational performance and effectiveness in the private sector (Kim and Lee, 2006), there is little work on knowledge sharing in the public sector. Relatively few scholars have paid attention to knowledge sharing in delivering public services (Taylor and Wright, 2004). Public administration and policy have not focused much on the development of knowledge management including knowledge sharing (Yao, Kam, and Chan, 2007), and little literature exists on knowledge sharing in the public sector. Recently, some scholars have begun to recognize the importance of knowledge to deal with current social problems, which arguably are more complex than the past and connected to a wider variety of stakeholders. The characteristics of problems in the public sector need more knowledge. Some studies about knowledge show that knowledge management and sharing are positively related to individual and organizational performance. Wiig (2002) argues that managing knowledge effectively can have a positive effect on the performance of public services.

As knowledge as an intangible asset is a potential source of competitive advantage (Cabrera and Cabrera, 2002), sharing knowledge among people in organizations is important. Knowledge sharing, which is a component of knowledge management, can help improve

government performance. Gorry (2008) argues that knowledge sharing can help public employees improve the quality of public services.

Recognition of the importance of the effect of knowledge sharing accompanies the need for study of the relationship between knowledge sharing and program performance. Recognition of the need for such study stimulated me to investigate possible relationships between knowledge sharing and program performance. This study has several primary purposes. First, it tries to find out more about the roles and effects of knowledge sharing on program performance in public organizations. Second, by examining the factors affecting the relationship between knowledge sharing and program performance, the study explores the importance of individual and organizational conditions in connecting knowledge sharing to program performance. Lastly, the study can help clarify the effect of knowledge sharing on program performance by also examining factors other than knowledge sharing that are likely to affect program performance.

1.2. Research questions

Many scholars assume that knowledge sharing is related to program performance (Fugate, Stank, and Mentzer, 2009; Kang, Kim, and Chang, 2008; Kim and Lee, 2006; Rulke and Zaheer, 2001). They argue that knowledge sharing has a positive impact on government program performance. However, there is little empirical evidence on the relationship between knowledge sharing and program performance in the public sector. Therefore, first, this study examines whether knowledge sharing and program performance are related in a government program.

Second, even though knowledge can be classified into two types-- explicit knowledge and tacit/implicit knowledge -- there is little empirical study of the relationships between explicit knowledge sharing and tacit knowledge sharing and of the two with government program performance. So, I sought to examine the relationships between program performance and the two types of knowledge sharing. If each type of knowledge sharing is related to program performance, another important question is whether and how they affect government program performance differently. Answering this second question required more detailed analysis of how each type of knowledge sharing influences program performance.

A related question is how and why those relationships unfold. Knowledge sharing and program performance are accomplished in varying individual and organizational contexts. Because knowledge itself is subjective and invisible, it is quite likely to be affected by individual and organizational conditions. For example, individual motivation or willingness to achieve a goal may affect knowledge sharing and program performance directly as well as indirectly. Therefore, it is necessary to identify what factors affect the relationship between knowledge sharing and government program performance. By doing so, one can better understand their relationships.

I propose that some factors can foster or block the relationship between sharing knowledge and program performance; that is, such factors are intervening variables in the relationship between knowledge sharing and program performance. This study examines the effect of such variables at the individual and the organizational levels on the relationship between knowledge sharing and program performance.

The last question is about alternative influences on program performance. Program performance is affected by many elements other than knowledge sharing. Therefore, alternative factors need to be examined to help clarify the effect of knowledge sharing on program performance.

In summary, the study has one core question: What is the relationship between knowledge sharing and government program performance? Several more detailed questions ensue:

- Are explicit and tacit knowledge sharing related to government program performance?
- If so, how do those relationships unfold?
- What individual and organizational factors intervene in the relationship of knowledge sharing and program performance?
- What alternative factors affect program performance?

1.3. Significance of the study

Why is this study important? First, it strives to make a significant scholarly contribution. As many scholars have noted, knowledge sharing is one of the important research areas linked to improving organizational and program performance. In areas of policy and program implementation, street-level bureaucrats are important. As the explicit and tacit knowledge of street-level bureaucrats often plays decisive roles in solving problems, knowledge sharing between and among those who directly deal with various problems may have a high probability of improving program performance. Yet, there is little study of the relationship between

knowledge sharing and program performance in the public sector. This study seeks to fill the gap in the scholarly literature by doing a deep investigation of knowledge sharing, a component of knowledge management, in several local government agencies in a single U.S. state.

Second, this study also can contribute to practice. As mentioned above, knowledge is an important resource in dealing with the problems public managers face. Depending on how public managers manage knowledge in organizations, individual and organizational performance can vary. Therefore, the degree of sharing knowledge with others can affect the performance of individuals and organizations. The study may provide practitioners insights into knowledge sharing that may improve public program performance.

1.4. Overview of the study

To examine knowledge sharing in the context of a government program, the study focused on the performance of the Child Protective Services (CPS) program in Virginia, examining explicit and tacit knowledge sharing among CPS staffers in the local agencies who implemented the program. The CPS program in Virginia is implemented at the county or city level. CPS staffers in each local jurisdiction accept and decide on the validity of reports of child abuse or neglect. Social workers deal with abused or neglected children and their guardians, investigate and assess the cases, and take measures to protect children from situations of abuse or neglect. The staffers' abilities to deal with these problems are important and related to the performance of the CPS program. I expected knowledge sharing among CPS staffers in each jurisdiction to be related to improved program performance. Moreover, since each jurisdiction had different individual and organizational contexts, I hypothesized that the

relationship between knowledge sharing and CPS program performance would vary with those differences and with the possible impact of local economic conditions, staffers' professionalism, and financial resources.

In addition to examining the effects of local economic conditions and available funds on program performance in all 134 localities, the study focused more intensely on 23 jurisdictions whose 116 CPS staffers responded to a survey focusing on knowledge sharing. As expected, the study found some meaningful results about the relationships among knowledge sharing of CPS staffers, individual and organizational factors and CPS program performance. Program performance in these 23 jurisdictions was affected by knowledge sharing among CPS staffers both directly and indirectly; individual and organizational factors turned out to affect different types of knowledge sharing.

1.5. Organization of the dissertation

The dissertation is organized as follows. Chapter 2 reviews the existing scholarly literature on knowledge, knowledge sharing and program performance. Chapter 3 introduces propositions and the conceptual framework for the study and presents the study methodology. It includes key variables and hypotheses as well as discusses the unit and levels of primary analysis, data sources and collection, and development of the study model. Chapter 4 analyzes the findings, and Chapter 5 presents conclusions and examines the theoretical and practical implications and the limitations of this research.

CHAPTER 2 Literature Review

This chapter reviews the scholarly literature on knowledge, knowledge sharing, and program performance to more fully understand their relationships. First, knowledge and several types of knowledge are introduced. The two types of knowledge that are the study's main focus, explicit and tacit knowledge, are defined and described in detail. In addition, the roles and concepts of explicit and tacit knowledge sharing in the literature are described. Second, diverse approaches to program performance are reviewed. Review of the scholarship on program performance reveals a potential gap in the study of the impact of knowledge sharing on program performance. Lastly, the literature on the relationships between knowledge sharing and program performance is examined. To fully understand the roles and the effects of knowledge sharing on program performance, I survey the literature on the role and the importance of street-level bureaucrats in program performance.

2.1. Knowledge and knowledge sharing

2.1.1. Knowledge

Knowledge sharing is the combination of knowledge and sharing. Therefore, it is necessary to discuss the concept of knowledge in order to clarify the concept of knowledge sharing. Scholars define knowledge in a variety of ways. For example, Nonaka and von Krogh (2009, p. 636) define it as "the actuality of skillful action" and "the potentiality of defining a

situation so as to permit skillful action." Davenport, De Long, and Beers (1998, p. 43) define knowledge as "a high-value form of information that is ready to apply to decisions and actions."

Different types of Knowledge can exist (Prat, 2006). On the basis of previous work on knowledge, Prat (2006) proposes four classifications for characterizing knowledge: explicitness, reach, abstraction level, and propositionality. First, depending on the degree of explicitness, there are explicit knowledge and tacit knowledge (Nelissen, 2002). Second, the reach classification distinguishes between individual and collective knowledge. Group, organizational, and inter-organizational knowledge are included in collective knowledge (Nelissen, 2002). Third, according to the level of abstraction, specific knowledge and general (abstract) knowledge can exist (Fowler, 2000). Lastly, there are declarative knowledge and procedural knowledge (Prat, 2006); declarative knowledge is about knowing what, while procedural knowledge is about knowing how.

This study focuses on explicit and tacit (or implicit) knowledge. Explicit knowledge refers to knowledge that is expressed by formal techniques. It can be more readily and directly observed, captured, transferred or communicated to others (Cabrera and Cabrera, 2002; Pardo, Cresswell, Thompson, and Zhang, 2006). Explicit knowledge exists in the form of documents and visual materials. Examples of explicit knowledge include a recipe, instructions for how to set up projector, and textbooks.

In contrast, tacit or implicit knowledge, which is broadly called local knowledge (Yanow, 2004), is subjective; it refers to practical know-how or intelligence based on experiential learning, which often is not openly expressed (Haynes, 2005; Wagar, 1998). Tacit knowledge is

knowledge embedded in individuals and is invisible to the outside observer. Examples of tacit knowledge are hard-to-communicate skills such as leading and managing a group, the ability to drive a car, or on-site investigation ability. Tacit knowledge is not directly expressed or captured in formal ways (Pardo, et al., 2006).[1] Some scholars argue that tacit knowledge is a source of competitive advantage for organizations and can be distinguished from explicit knowledge (Kogut and Zander, 1992; Nonaka and Von Krogh, 2009; Winter, 1998). Explicit knowledge has a universal character, supporting the capacity to act across contexts. Tacit knowledge is related to the senses, experiences, intuition, unarticulated mental models, or implicit rules of thumb (Nonaka and Von Krogh, 2009).

2.1.2. Knowledge sharing

Knowledge sharing is not an easy concept to define. It is often used to mean the same thing as knowledge transfer and knowledge management (Kang, et al., 2008). Knowledge sharing is a broader concept than simple transfer of knowledge, emphasizing the process of or social interaction for knowledge exchange (Grant, 1996; Gupta and Govindarajan, 2000). However, it is a narrower concept than knowledge management, which includes knowledge creation, transfer, and sharing. Many scholars have tried to define knowledge sharing in the private and public sectors. Jacobson (2006, p. 507) refers to knowledge sharing as "an exchange of knowledge between individuals," and Lindsey (2006, p. 499) defines knowledge sharing as "facilitating learning, through sharing, into usable ideas, products and processes."

[1] However, Geisler (2009) examined tacit knowledge in the performance of individuals and teams in a hospital emergency department through two case studies. He argues that tacit knowledge could be measured by the difference between total explicit knowledge and total overall knowledge.

Taylor and Wright (2004) examine the factors influencing knowledge sharing in the public sector. They report statistically significant relationships between knowledge sharing and factors such as open leadership climate, information quality, satisfaction with change processes, learning from failure, a vision for change, and performance orientation. They emphasize top-down communication flow, familiarity with procedures or rules, non-monetary rewards, and the perception of motivation and ability to accept current performance levels. As well, they argue that attitudes about information on performance, a climate of honesty and openness, a willingness to face the realities of service performance levels, the pervasive fear of punishment for poor performance, and lack of customer focus all affect knowledge sharing (Taylor and Wright, 2004). Yao, Kam, and Chan (2007) show factors that facilitate and hinder knowledge sharing between Hong Kong government employees by using a case study and a survey. They argue that employees primarily use relationships and informal networks to share their knowledge. In addition, they contend that knowledge sharing is affected by national culture, informal relationships, management support, incentives or rewards, lack of time due to heavy workloads, and individual benefits, suggesting that it would be possible that low morale, serious budgets deficits in government agencies, and trust could influence knowledge sharing (Yao, et al., 2007).

By examining the relationships between the degree of ties between organizational subunits and knowledge sharing, Hansen (1999) shows the effect of closeness of relationships on knowledge sharing. In his study, a project team's search for knowledge is improved by weak inter-unit ties, but the transfer of complex knowledge is impeded by such inter-unit ties

(Hansen, 1999). Cabrera and Cabrera (2002) see knowledge sharing from the perspective of a public good dilemma: sharing ideas with others may carry costs for some individuals. As ways to overcome such a dilemma, they present three intervening variables-- the pay off (reward) system, efficacy perceptions,[2] senses of group identity and personal responsibility-- that foster knowledge sharing. By studying individual-level factors affecting knowledge processes including knowledge sharing, Andrews and Delahaye (2000) find that perceived trustworthiness is one of the important factors that affect knowledge sharing decisions. Tsai (2002) examines the relationships between formal hierarchical structure and informal lateral relations and knowledge sharing among organizational units. He finds that formal hierarchical structure has a statistically significant negative effect on knowledge sharing. But informal lateral relationships, measured by social interaction, have a significant positive impact on knowledge sharing, though not among units that compete with each other for internal resources (Tsai, 2002).

There is controversy, however, about the relationships between rewards or reward systems and knowledge sharing and the level of IT usage and knowledge sharing. When Bock and Kim (2002) examine the factors affecting knowledge sharing, the results show that expected rewards and the level of IT usage are not significantly associated with knowledge sharing, even though other expected associations are significantly related to knowledge sharing. Ho (2008) investigates the relationships between self-directed learning, organizational learning, knowledge management capability and organizational performance. He finds that

[2] Perceived efficacy comes from expectancy value theory; people's expectations about the potential effects of their actions directly affect their willingness to act. When organizational members perceive that sharing their knowledge is helpful to co-workers and can increase the value of the shared good, they are more willing to share their knowledge.

organizational performance is directly affected by organizational learning and knowledge management capability. As well, self-directed learning affects organizational learning and knowledge management capability. In other words, self-directed learning affects organizational performance through organizational learning and knowledge management capability (Ho, 2008).

Examining the effect of types of coordination on knowledge sharing between departments in public organizations, Willem and Buelens (2007) find that lateral and informal coordination affects interdepartmental knowledge sharing. Kim and Lee (2006) examine how organizational structure, culture and information technology influence knowledge sharing among employees in public organizations and in private organizations. They argue that factors such as social networks, reward system, IT application usage, and years of work significantly influence knowledge sharing capabilities in both the public and the private sectors (Kim and Lee, 2006).

Knowledge sharing is not a technical issue, but a social one (Gorry, 2008). As shown above, knowledge sharing is affected by a variety of factors including individual, organizational, and social variables. Most studies deal with the preconditions of knowledge sharing under the assumption that knowledge sharing has a positive impact on organizational performance in the private and public sectors.

2.2. Program performance

A program can be defined as a set of related activities that is intended to achieve certain objectives (McDavid and Hawthorn, 2006). Program performance is the degree to which a program achieves its intended objectives. A public program, which has specific public purposes

or goals, can achieve varying degrees of performance (or outcomes) through program implementation (Ratcliffe, Nightingale, and Sharkey, 2007). Even though many scholars often use other terms like organizational performance, policy performance, program outcomes or government performance (Goerdel, 2006; Gueorguieva et al., 2009; Jennings Jr and Ewalt, 1998; Meier and O'Toole Jr, 2002; Meier, O'Toole Jr, and Goerdel, 2006), they are focusing on "program performance." As a result, if references to organizational performance, policy performance or government performance in existing literature study program performance, I regard them as relevant to program performance and review them here.

A variety of studies have examined program performance. Rainey and Steinbauer (1999) conceive the dimensions of effective government organizations as including the relations with internal and external stakeholders, autonomy, mission valence, organizational culture, leadership, task design, technology and developed human resources, professionalism, and motivation. Kim (2005) finds strong positive relationships between organizational performance and individual factors, such as job satisfaction, organizational commitment, public service motivation, and organizational citizenship behavior. Sandfort, Selden, and Sowa (2008) test the relationships between government tools such as grants, contracts, and vouchers and organizational performance; for them, four dimensions of performance are management capacity, management outcomes, program capacity, and program outcomes. The results show that grants have the most significant and positive effects on overall organizational performance (Sandfort, et al., 2008).

In addition, Meier and O'Toole (2002) argue that public managerial quality can affect program performance. By testing the relationships between managerial quality and program performance, they show that public school superintendents' quality affects student achievement. Unlike many scholars, Kassel (2008) contends that compliance with rules can have a positive impact on program performance. According to Heinrich (2002), performance management based on outcomes cannot directly affect government program effectiveness, due to conflicting goals, limited information, and untimely feedback. However, it can indirectly affect program performance by providing public managers with useful information about policy levers.

Some scholars hypothesize that qualified management facilitates program success or affects program outcomes (Avellaneda, 2009; Coggburn and Schneider, 2003). Avellaneda (2009) argues that mayoral qualifications, such as education and job-related experience, can affect municipal performance positively, even though this positive influence is decreased by external constraints. Meier et al. (2006) find that the interaction of gender and management strategy affects program performance. They show that program performance is affected by management activities (based on Mark Moore's classification) as well as managers' gender. Jennings and Ewalt (1998) report that coordination and administrative consolidation have positive effects on program performance. According to Ratcliffe et al. (2007), labor market conditions and caseload characteristics affected program performance in South Carolina's Family Independence Program.

In summary, there have been many studies of program performance in the public sector. They focus on numerous influences, varying from individual factors to institutional contexts. However, scholarship on the relationship between program performance and knowledge sharing still is generally lacking in the public sector. Next, I examine existing literature on knowledge sharing and program and organizational performance.

2.3. Knowledge sharing and program performance

2.3.1. Street-level bureaucrats and program performance

As has been suggested, program performance can be affected by many factors. Program performance is affected by the interrelationships among institutional, organizational, and primary work domains of governance (Lynn, Heinrich, and Hill, 2001). They present a "reduced form model" to capture the effect of different levels of governance factors on program performance conceived as program outputs or outcomes (Lynn, et al., 2001).[3] Street-level bureaucrats are critical actors in primary work domains (Glisson, 1992). Street-level bureaucrats play a role as connection or intervention points between problems and programs. They intervene between the problems and program implementation using their skills and equipment. Street-level bureaucrats carry out the functions of an organization's core technology associated with performing organizational tasks (Scott, 1998). The Dunleavey's model of bureau-shaping behavior pays attention to the importance of preferences prevailing

[3] According to Lynn et al. (2001), the reduced-form model is O=f (E, C, T, S, M) where O=outputs/outcomes (individual level and/or organizational outputs/outcomes), E=environmental factors, C=client characteristics, T=treatments (primary work/core processes/technology), S=structures, M=managerial roles and actions.

at the technical levels of organizational activity, occupied by street-level bureaucrats (Dunleavy, 1992).

Many scholars point to primary work[4] as an important factor affecting program performance; street-level bureaucrats do such primary work. The issue at the technical (primary work) level includes the actions and judgments of street-level workers and their supervisors (Lynn, et al., 2001). In other words, the role of street-level bureaucrats is emphasized for achieving better program performance. For example, Thompson (1967) pays attention to the primary work performance of street-level bureaucrats, such as teachers working in classrooms, officials processing income tax returns, and supervisors overseeing physical production. Kaufman (1981) observes that street-level bureaucrats who are implementing programs are often beyond the control of top managers. Lipsky (1980) also highlights the significant effects of street-level bureaucrats on public policy implementation. In addition, many studies focus on street-level bureaucrats in implementing jobs programs (e.g., Sandfort, 2000) and welfare reforms (e.g., Meyers, Glaser, and Mac Donald, 1998).

2.3.2. The importance of knowledge sharing by street-level bureaucrats

The knowledge of street-level bureaucrats is important in dealing with the problems they face. Street-level bureaucrats define those problems and situations and make judgments on the basis of their knowledge. The degree of policy understanding and knowledge of street-level bureaucrats affect their behavior (Meyers and Vorsanger, 2003). Even though rules

[4] A.K. Rice argues that in order to survive every system has a primary task which refers to the basis of primary work systems, the source of legitimacy and meaning for the organization's employees.

provide general guidance, street-level bureaucrats often depend on pragmatic improvisation, because they assume that rules are applied in an idealized world of predictability and clear categories, a world far removed from their own street-level work (Maynard-Moody and Musheno, 2003). As implementers of policies or programs whose behavior can affect program performance, front-line workers' knowledge is one of the keys to better program performance.

Many studies have focused primarily on connections between policy or program missions or goals and the implementation activities of street-level bureaucrats, including the compliance of street-level workers with the intent of policy or program decision makers. From this perspective, it is hard to emphasize knowledge sharing of street-level bureaucrats, because these workers in program implementation do not need to strive to look for better ways to handle their work. As a result, there has been little study of the relationship between knowledge sharing and program performance in public organizational contexts. However, scholarship on knowledge sharing examines street-level bureaucrats as being significant for better program performance, and their knowledge is reviewed as an important tool in improving program performance. Knowledge sharing is a way to enhance the knowledge of street-level bureaucrats. Therefore, studies on the knowledge and knowledge sharing of street-level bureaucrats can help to more fully understand program performance.

2.3.3. Knowledge sharing and program performance

Schneider finds that knowledge exists in many forms and that coproduction through collaboration produces useful new ways of approaching problems, which in turn can help improve performance (Schneider, 2009). Kang, Kim, and Chang (2008) examine the relationship

between knowledge sharing and individual-level work performance in the public sector. They find that knowledge sharing significantly affects work performance, and mutual trust plays a role mediating the relationship between knowledge sharing and work performance. Fugate, Stank, and Mentzer (2009) report positive relationships between improved knowledge management in logistics operations and organizational performance. By testing the effect of knowledge sharing on individual performance and the interaction effect between knowledge sharing and goal-setting on individual performance, Quigley, Tesluk, Locke, and Bartol (2007) find a positive impact of knowledge sharing on performance and an interaction effect between motivational mechanisms and knowledge sharing on the relationship with performance.

In addition, Grant (1996) argues that knowledge sharing can strengthen organizational effectiveness by maximizing the utilization of shared knowledge by members in organizations. Chakravarthy, Zaheer, and Zaheer (1999) view knowledge sharing as a process for improving effective organizational performance by accessing useful knowledge from other work units. Gorry (2008) also contends that knowledge sharing can help workers improve the quality of public services, and successful knowledge sharing needs institutional support and encouragement. Examining the influence of knowledge management on organizational performance in the public as well as the private sectors, Anantatmula (2007) emphasizes improved communication and enhanced collaboration in knowledge management to improve productivity and decision making. A study by Gottschalk (2007) yields several propositions about the relationship between knowledge sharing and management capabilities, which may in turn affect organizational performance. His study suggests that increases in knowledge sharing

will improve resource mobilization, decision making capability, strategic ability, and the ability to link implementation elements. According to Lesser and Storck (2010), the ongoing activities of communities of practice affect organizational performance positively by decreasing the learning curves of new employees, responding more rapidly to customer needs and inquires, reducing "reinvention of the wheel,"[5] and spawning new ideas for products and services.

Summary

Many studies show that knowledge sharing is related to organizational performance. For the most part, the studies of the effects of knowledge sharing on organizational performance focus on the private sector. Empirical results support theoretical propositions about the positive relationship between knowledge sharing and organizational performance. However, rather little empirical research examines the relationship between knowledge sharing among street-level bureaucrats and program performance in the public sector.

Existing scholarship on knowledge sharing and performance highlights knowledge sharing by street-level bureaucrats as an important factor that affects program performance. Therefore, it is meaningful to examine if and how knowledge sharing affects government program performance. The next chapter will outline how this study explored the relationship between knowledge sharing and program performance.

[5] This means that members have the ability to more easily reuse existing knowledge assets. This can reduce the costs of "knowledge deficits," which include costs and inefficiencies that result from intellectual organizational rework, sub-standard performance, and the inability to find knowledge resources.

CHAPTER 3 Study Design and Methodology

This study focuses on the relationship between knowledge sharing and program performance in public sector agencies. Based on existing scholarship about knowledge sharing and program performance, I introduce a conceptual framework that seeks to account for that relationship and for other possible influences on performance. As already mentioned, even though some studies examine the factors that affect knowledge sharing in the public sector, few empirically examine the relationship between knowledge sharing and program performance. Yet, sharing knowledge with other workers and clients arguably is meaningful when it is related to individual and organizational performance.

This study explores the relationship between knowledge sharing and program performance by following three steps. First, it examines the direct effect of explicit and tacit knowledge sharing on program performance. Second, to explore possible intervening variables, the research probes the effects of individual and organizational factors on the relationships between explicit and tacit knowledge sharing and program performance. In the last step, this study examines the effect of alternative factors on program performance.

The Child Protective Services (CPS) program in Virginia was selected to explore these relationships. The study examines the diverse relationships among knowledge sharing by CPS staffers, individual, organizational, and alternative explanatory factors and the performance of the CPS program. Following introduction of the conceptual framework, dependent and

independent variables are operationalized. The chapter also describes the sources, collection, and analysis of data.

3.1. Conceptual framework

3.1.1. The first step: knowledge sharing and program performance

Although some studies find that knowledge dissemination, which is an important part of knowledge sharing, does not support performance in the private sector (e.g., Darroch, 2005), many hypothesize that knowledge sharing has a positive effect on individual and organizational performance (Kang, et al., 2008; Kim, 2005; Kim and Lee, 2006). Knowledge known to organizations like know-how and best practices could save money and produce better organizational performance (O'Dell and Grayson, 1998). Kang, Kim and Chang (2008) also find that knowledge sharing enhances individual work performance in public organizations. Knowledge sharing can improve program performance by applying new knowledge in public programs (Kwun and Lee, 1999). Sharing knowledge with organizational members can maximize the use of knowledge, which can produce greater organizational effectiveness (Grant, 1996). In addition, knowledge sharing between units within organizations can improve organizational units' performance (Rulke and Zaheer, 2001). Fugate et al. (2009) find that knowledge sharing has a positive impact on organizational performance through the shared interpretation of knowledge. Therefore, according to these studies in the private and the public sectors, knowledge sharing has a positive impact on organizational and program performance.

Further, it is necessary in examining the possible effects of knowledge sharing on program performance to distinguish between explicit and tacit knowledge sharing. Nonaka and

von Krogh (2009) argue that this is important for theoretical and practical reasons. First, researchers can analyze the interaction between tacit and explicit knowledge or pay attention to either of them. Second, from the perspective of management practice, the distinction between tacit and explicit knowledge allows researchers to discuss more about the tacit knowledge that people use to solve tasks (Nonaka and Von Krogh, 2009).

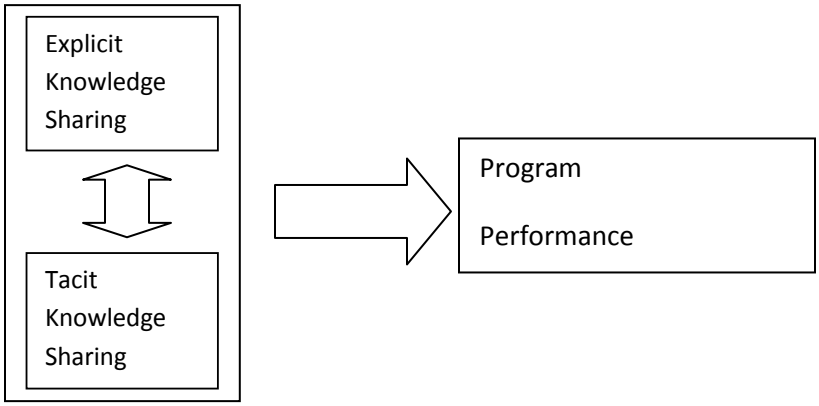
Nonaka (1994) also argues that there are different patterns of conversion between tacit and explicit knowledge. Tacit knowledge can be converted to explicit knowledge and explicit knowledge can be converted to tacit knowledge.[6] Knowledge conversion theory indicates that explicit and tacit knowledge are affected by each other. I expect the relationship to be positive because tacit and explicit knowledge are complementary and can be expanded in these processes (Nonaka, 1994). For example, increased explicit knowledge can increase tacit knowledge by internalization, and increased tacit knowledge can increase explicit knowledge by externalization.

This study examines the effects of CPS staffers' reported explicit and tacit knowledge sharing on program performance. By testing those relationships, I can examine whether and to what extent explicit knowledge sharing and tacit knowledge sharing each affect program performance. As well, this study can examine whether and the degree to which explicit knowledge sharing and tacit knowledge sharing affect each other. Figure 3-1 suggests three

[6] The processes and reasons for conversion between tacit and explicit knowledge are different. Nonaka calls conversion of tacit knowledge into explicit knowledge "externalization," and conversion of explicit knowledge into tacit knowledge "learning" or "internalization." The "externalization" process is closely related to the use of "metaphor," and "action" plays a critical role in the "internalization" process (Nonaka, 1994).

propositions about the relationships between explicit/tacit knowledge sharing and program performance as well as between explicit and tacit knowledge sharing.

Figure 3-1: Explicit and Tacit Knowledge Sharing and Program Performance



P1: Explicit knowledge sharing will have a positive impact on program performance.

P2: Tacit knowledge sharing will have a positive influence on program performance.

P3: There will be a positive relationship between explicit knowledge sharing and tacit knowledge sharing.

3.1.2. The second step: intervening variables between knowledge sharing and program performance

As the second step, this study examines intervening factors that might affect the relationship between knowledge sharing and program performance. Yoo (2002) hypothesizes that "organizational buffers" influence the relationship between organizational characteristics and client outcomes. Knowledge sharing, regardless of whether it is explicit or tacit, and program performance cannot be freed from organizational setting. Depending on a variety of

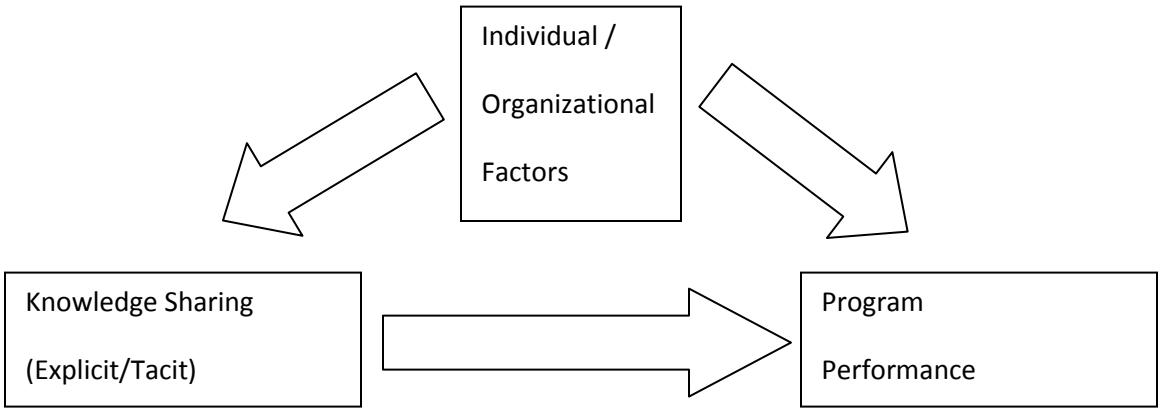
conditions, the effect of knowledge sharing on program performance can vary. For example, Kang et al. (2008) also report that mutual trust can have a positive impact on the relationship between knowledge sharing and work performance.

Thus identifying intervening variables may help one to better understand the relationship between knowledge sharing and program performance. This study hypothesizes that several individual and organizational factors are likely to affect the relationship between knowledge sharing and program performance. (See Figure 3-2.) Individual and organizational factors can have direct as well as indirect effects on program performance. Individual and organizational factors can affect program performance through explicit or through tacit knowledge sharing. For example, Quigley et al. (2007) find that individual motivation such as self-set goals influences knowledge sharing as well as directly and indirectly affects individual performance.[7] Goal setting is an important motivation to look for, since it suggests that individuals will use available knowledge to achieve goals and contribute to high levels of performance (Quigley, et al., 2007). Lam and Lambermont-Ford (2010) also show that individual norms help individuals to share their knowledge in interdependent teamwork. The results of the study show a direct effect of Individual norms on knowledge sharing (Lam and Lambermont-Ford, 2010). In addition, Kim and Lee (2006) examine structure as an organizational factor that affects knowledge sharing, looking at the effects of centralization, formalization, and performance-based reward system. Individual and organizational contexts,

[7] Self-set goals refer to the targets determined by each individual to achieve his or her objectives. According to Lock and Latham (2002), individuals are motivated by goals to achieve higher degrees of performance.

then, can be understood as intervening in relationships between knowledge sharing and program performance.

Figure 3-2: Knowledge Sharing, Individual and Organizational Factors, and Program Performance



P4: Individual factors will influence knowledge sharing and program performance.

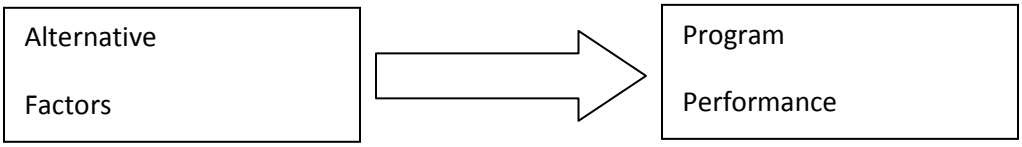
P5: Organizational factors will influence knowledge sharing and program performance.

3.1.3. The third step: alternative factors that affect program performance

In addition, program performance can be affected by a variety of factors other than knowledge sharing. Programs are exposed to many alternative influences, such as laws, monetary resources, economic conditions and available expertise or technical skills. Among the possible factors in the relationship between governance and performance, Lynn, Jr. et al. (2001) include institutional, managerial, and technical factors that may affect government performance. Lee (2008) also shows that organizational performance can be affected by institutional and technical as well as organizational factors.

Even though this study focuses on the effects of knowledge sharing and individual and organizational variables on program performance, it needs to examine factors that may also or instead affect program performance. I can further clarify the effect of knowledge sharing on program performance by examining such alternative explanatory factors. Therefore, as the third step, the study examines possible alternative explanations for program performance. (See Figure 3-3.)

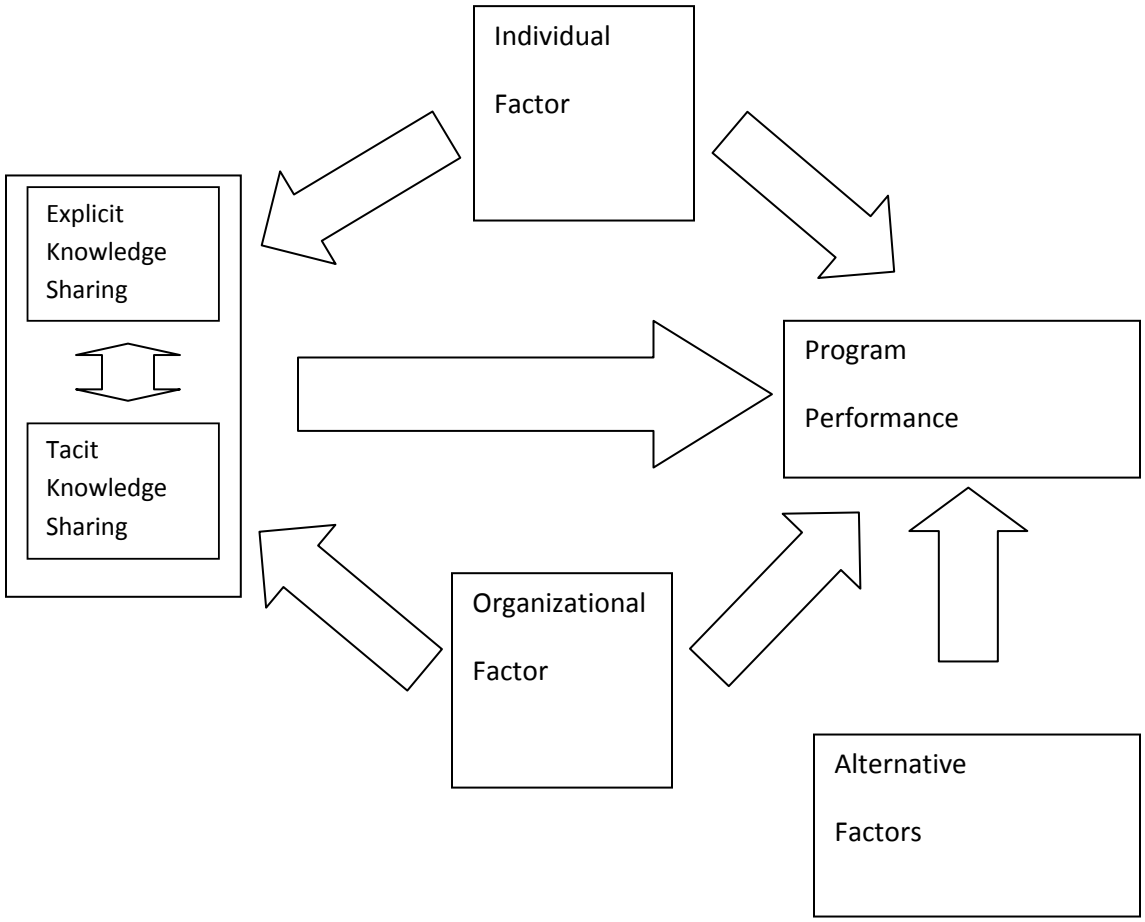
Figure 3-3: Alternative Factors and Program Performance



P6: Program performance will be affected by influences other than knowledge sharing.

Figure 3-4 shows all of the possible hypothesized relationships.

Figure 3-4: Conceptual Framework



Summary

The study's conceptual framework allowed me to examine diverse relationships among knowledge sharing; individual, organizational, and alternative factors; and program performance. Analysis was divided into looking at three steps to examine more detailed relationships among variables. The first step involved the simple relationships between knowledge sharing and program performance as well as between explicit knowledge sharing and tacit knowledge sharing. The second step examined the role of intervening variables in the

relationships between knowledge sharing and program performance. Finally, the third step sought to isolate effects of knowledge sharing on program performance by controlling for alternative explanatory factors. The next section describes the methods the study used.

3.2. Case selection and justifications

3.2.1. Case selection

To explore the relationships among explicit and tacit knowledge sharing, public service motivation, self-set goals, red tape, economic conditions, staff professionalism, budgetary resources, and program performance, I focused on Virginia's Child Protective Services program. The CPS program involves different levels of government. For example, a federal statute (the Child Abuse Prevention and Treatment Act) deals with child abuse or neglect and a federal government agency (Administration for Children and Family in the U.S. Department of Health and Human Services) gives relevant funding to state agencies. The Virginia Department of Social Services determines the guidelines and policies for the state's CPS program and supervises its implementation by local agencies. There are 120 local CPS departments implementing the program in Virginia.[8]

I focused on the implementation of the CPS program. The study explored the activities of CPS staffers (supervisors and caseworkers) in local agencies in Virginia who implement the CPS program. More specifically, the study examined the degree and dynamics of knowledge sharing at the local jurisdictional as well as at the individual levels and CPS program

[8] There are 134 local jurisdictions in Virginia. One combined local agency deals with the functions of some small local jurisdictions. For example, Covington City and Alleghany County have one CPS program.

performance in each of the 23 local CPS departments in which staffers responded to an on-line survey. In addition to these relationships, the study also examined the effects of individual and organizational factors in local CPS departments on the relationships between knowledge sharing and program performance.

3.2.2. **Justifications for case selection**[9]

I selected the Virginia CPS program for two primary reasons. First, it seemed quite possible for knowledge about the program to affect CPS program performance. As street-level bureaucrats, CPS staffers need information, know-how, intuitions, skills and strategies to help protect children from abuse or neglect. Knowledge sharing by CPS staffers can increase the likelihood of protecting abused or neglected children. That is, knowledge sharing by CPS staffers can affect CPS program performance. The program is well matched to the purposes of the study, which was to explore knowledge sharing among public employees and program performance as well as to examine the individual and organizational factors that can influence the relationship between knowledge sharing and program performance.

In particular, the study examined knowledge sharing in a single state program with numerous implementing units. By examining variation in program performance among the local CPS program departments and variation in individual reports of knowledge sharing, this study sought to trace the impact of knowledge sharing on program performance while controlling for program and state and national governmental influences.

[9] As Yin (2003) has noted, case studies can have three main purposes: exploratory, descriptive, or explanatory. Examination of the CPS program strove to explain the relationship between knowledge sharing and CPS program performance.

Second, the Virginia Department of Social Services (VDSS) has been trying to increase knowledge sharing through its OASIS (On-line Automated Services and Information System) internal information system.[10] Employees in local CPS departments have many opportunities to share their knowledge through such information systems (explicit sharing) as well as through face to face contacts (tacit sharing). Increases in the chances to accept and distribute new knowledge also were well matched to the purpose of the study.

3.3. Description of variables

3.3.1. Dependent variable: CPS program performance

Since there is no standard way to measure performance, diverse approaches exist (Punyaratabandhu-Bhakdi, 1983). Program performance can be measured by aggregate program level results to track ongoing achievement of specific objectives (Ratcliffe, et al., 2007). Therefore, it is necessary to determine criteria for tapping program performance. Even though criteria for measuring program performance in the public sector are not easy to set, many have tried to do so. For example, Boyne presents five conceptual categories as criteria for measuring performance: outputs, efficiency, effectiveness, responsiveness and democratic outcomes

[10] OASIS(the On-line Automated Services and Information System) is a case management system that primarily is used by local social service workers. It was implemented in 1997. CPS cases were added to the system in 1999. The primary role of OASIS is to provide a comprehensive automated case management system of record for adoption, foster care, and CPS. It has three primary functions: serving as a case management system, providing a central registry, and collecting reporting and statistical information. OASIS maintains the majority of case information including client demographic data, interview notes, and case findings. It allows caseworkers to search the system for prior cases of abuse and neglect by abuser and by victim. The central registry contains a list of individuals who have been found to have abused or neglected a child following a CPS investigation. OASIS also provides some report functions for local and state DSS workers, and it provides a list of outstanding items for caseworkers and supervisors, such as cases that need to be closed, notices that need to be sent to an abuser, and other required case documentation. It can provide statistical data on cases of child abuse and neglect.

(Boyne, 2003). Performance can be measured by using a variety of methods including inspections, user and citizen satisfaction surveys and archival data (Boyne, 2006).

This study used program outputs and outcomes as its performance measures. According to McDavid and Hawthorn (2006), program outputs typically are ways of representing the amounts of work that are done as the program is implemented. For example, "the number of clients trained" would be an output in a job training program. Program outcomes are the intended results that are linked to program objectives. Programs usually have several outcomes. For example, in a housing rehabilitation program, a short term outcome would be the number of dwellings that have been rehabilitated. Then, a longer term outcome would be the rate of turnover of residents in the neighborhood (McDavid and Hawthorn, 2006). In addition, depending on whether a goal is shorter term or longer term, outcomes can vary. For example, child protection agencies should consider a child's immediate safety as a short term goal and the enhancement of child safety over the longer term (Barth and Jonson-Reid, 2000).

The purpose of the CPS program is to protect children who are victims of abuse or neglect. The primary goals of the program are to prevent future abuse and neglect of children who have been victims, while continuing to preserve families to the extent possible (JLARC, 2005). Based on the purpose of the CPS program, the outputs of the child protective services program can include the number of children in foster care due to abuse or neglect, and outcomes can tap the numbers of child abuse or neglect in certain areas.[11] Paxson and

[11] When I interviewed CPS staffers about the program's performance, they regarded numbers of cases of child abuse or neglect as a criterion to measure CPS performance.

Waldfogel (2003) use the incidence of reported cases of child maltreatment as an indicator of child abuse or neglect. Sabotta and Davis (1992) also regard the number of victims of child maltreatment as an indicator of child abuse or neglect. Barth and Jonson-Reid (2000) use numbers or rates of child death in a geographic area as indicators for measuring the outcome of child welfare services. To measure the performance of the CPS program, this study used the indicators rates of reported child abuse or neglect and rates of children in foster care due to abuse or neglect per 1000 children between 2007 and 2009. The data for these indicators were collected from the Virginia Department of Social Services.

a. Change in child abuse or neglect rates (outcome variable)

One of the measures of CPS performance focuses on the degree of child abuse or neglect by year. The Virginia Department of Social Services provides local rates of abuse and neglect per 1000 children every year. The study used the change in rates of abuse and neglect per 1000 children in each local jurisdiction from 2007 to 2009 to measure the performance of the CPS program. The reason I chose the years 2007 through 2009 is that child abuse or neglect may be strongly related to economic factors. The economic situation in localities may be an important element in the performance of the CPS program. The economic recession in the United States began in late 2006. In spite of the recession, child abuse or neglect rates in some local jurisdictions dropped, while those in others increased. Therefore, this time period allows

me to see the possible effects of both the local economy and CPS effects on rates of child abuse or neglect.[12]

b. Change in foster care rates (output variable)

Another indicator to measure the performance of CPS program is the foster care rate. Foster care is substitute care for children taken away from their parents or guardians. Children are placed in foster care by order of a court (called an involuntary placement) when a child has been abused or neglected or may be at risk of abuse or neglect by his or her parent or by someone else in the household or because a court has determined that is in the best interest of the child to be under the supervision of someone else. Then the court orders the child removed from the home and determines the length of the foster care placement. When CPS staffers conduct family assessments or investigations, they have the option available to petition a court to remove children from a home. CPS staffers play an important role in placing abused or neglected children in foster care. Foster care rates, then, can be used as an output variable for CPS program performance. The Virginia Department of Social Services reports the number of children in foster care by month. To measure foster care rates in each of the local jurisdictions, the mean annual number of children in foster care was divided by the number of child abuse or neglect cases in each of the local jurisdictions. Change in foster care rates from 2007 through 2009 was used as another dependent variable to tap CPS program performance in the study.

3.3.2. Independent variables

a. Knowledge sharing

[12] Data tracing child abuse or neglect rates in Virginia from 2000 through 2009 appear in Appendix E.

Knowledge sharing is not easy to measure because it includes several dimensions such as knowledge acquisition, helpfulness and interaction with others. This study used individual reports of knowledge sharing as an indicator of knowledge sharing instead of a more objective measure. As knowledge is subjective, responses about knowledge sharing may be appropriate. The study measured three dimensions of explicit and tacit knowledge sharing: the time workers devoted to knowledge sharing, the usefulness (the degree and the helpfulness) of knowledge sharing[13] and access to knowledge sharing.[14] By measuring each type of knowledge sharing on these three dimensions, I was able to look for relationships among them. Several survey questions tapped knowledge sharing, using 4 point or 7 point scales.[15]

- **Explicit knowledge sharing**

Based on the concepts of explicit knowledge and knowledge sharing, the study defines explicit knowledge sharing as "employee perceptions of the degree of shared knowledge communicated through paper or electronic documents and the helpfulness of that knowledge."

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[13] As will be seen, reports of the degree and the helpfulness of knowledge sharing were combined into a variable called "usefulness" of knowledge sharing, because both loaded on the same factor in a factor analysis, which eliminated the problem introduced by the variables' high collinearity.

[14] Cummings (2004) used the time (frequency) of knowledge sharing within and outside of groups to measure knowledge sharing. Kim and Lee (2006) used the degree and the accessibility of knowledge sharing to measure knowledge sharing. Bock et al. (2005) used one's positive feelings about sharing one's knowledge to measure attitude toward knowledge sharing.

[15] Time devoted to knowledge sharing was measured using a 4 point scale. For time devoted to explicit knowledge sharing, response options were: 1) rarely if ever, 2) once or twice a day, 3) 3-5 times a day, and 4) 6 times or more, and for tacit knowledge sharing, 1) less than once a week, 2) once or twice a week, 3) 4-5 times a week (almost once every day), and 4) more than six times a week (more than once every day). The other items of knowledge sharing used 7 point scales:1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, and 7) strongly disagree.

The time devoted to,[16] the usefulness of,[17] and access[18] to explicit knowledge sharing were measured by several survey items. Based on the conceptual framework, the hypotheses about the relationships between explicit knowledge sharing and CPS program performance as well as explicit knowledge sharing and tacit knowledge sharing were formulated. First, I hypothesized that the time devoted to, the usefulness of, and access to explicit knowledge sharing would affect CPS program performance. Regarding changes in child abuse or neglect rates, these variables were hypothesized to have a positive effect on CPS program performance.[19] For changes in foster care rates, it was hard to say the directions of the effect of knowledge sharing variables on CPS program performance, because knowledge sharing could help increase or reduce the rates of foster care. That is, CPS program performance could be evaluated by how foster care was used more than by how many children were in foster care. For example, for a child, being placed in foster care could be better than staying at a home in some cases, but in other cases, staying at home could be better than foster care.

Second, I hypothesized that the time devoted and access to explicit knowledge sharing would affect the reported usefulness of explicit knowledge sharing. According to Money and

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[16] In a typical day, how many times do you look for guidance in paper or electronic documents (e.g., CPS procedures, OASIS) for your work?

[17] Two survey items measured the usefulness of explicit knowledge sharing: 1) I find and share know-know, information, and knowledge through paper or electronic documents (e.g. CPS procedures, OASIS). 2) Knowledge, information, and know-how in paper or electronic documents (e.g. CPS procedures, OASIS) help me to handle my caseload.

[18] I can easily access paper or electronic documents, information, and knowledge that others in my unit have.

[19] The relationships between the time devoted to, the usefulness of, and access to knowledge sharing were hypothesized to have negative effects on changes in child abuse or neglect rates, because decreases in child abuse or neglect rates between 2007 and 2009 was considered improvement in CPS program performance.

Turner (2004), the ease of use of a knowledge system positively affects the perceived usefulness of the system.[20] Similarly, accessibility to knowledge has a positive effect on the usefulness of explicit knowledge. Kraemer et al. (1993) found that the frequency of access to information had a positive effect on the perceived usefulness of the information.

Third, I hypothesized that the usefulness of explicit knowledge sharing affected the usefulness of tacit knowledge sharing, because when CPS staffers believed that sharing explicit knowledge was helpful in handling their work, they also would find sharing tacit knowledge to be helpful. Smith (2001) and Nonaka and Von Krogh (2009) also explained that explicit knowledge can affect tacit knowledge.

The study tested three sets of hypotheses about explicit knowledge sharing. (See Table 3-1.)

Table 3-1: Hypotheses about Explicit Knowledge Sharing

H1-a1: As the time devoted to explicit knowledge sharing increases, child abuse or neglect rates will decrease.
H1-a2: The time of explicit knowledge sharing will affect changes in foster care rates.
H1-b: As the time devoted to explicit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.
H2-a1: As usefulness of explicit knowledge sharing increases, child abuse or neglect rates will decrease.
H2-a2: Usefulness of explicit knowledge sharing will affect changes in foster care rates.
H2-b: As usefulness of explicit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.

[20] It is based on the Technology Acceptance Model (TAM) by Davis (1989).

H3-a1: As access to explicit knowledge sharing increases, child abuse or neglect rates will decrease.
H3-a2: Access to explicit knowledge sharing affects changes in foster care rates.
H3-b: As access to explicit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.

- **Tacit knowledge sharing**

Tacit knowledge sharing refers to "employee perceptions of the degree of shared knowledge communicated through formal or informal discussions, meetings or collaboration with co-workers and the helpfulness of such knowledge." The tacit knowledge embedded in organizational members encompasses much of the knowledge that affects the effective performance in the organization (Howells, 1996). This study hypothesized that the time devoted to, the usefulness of, and access to tacit knowledge sharing would affect the performance of the CPS program. Survey items measured the time devoted to,[21] the usefulness of,[22] and access[23] to tacit knowledge sharing.

The usefulness of tacit knowledge sharing can be related to time devoted and access to tacit knowledge sharing. The time of access to information positively affects the perceived

[21] In a typical week, how many times do you have discussions or meetings for your work?

[22] As with explicit knowledge sharing, two survey items measured the usefulness of explicit knowledge sharing: 1) I find and share know-how, information, and knowledge through discussions, meetings, or collaboration. 2) The knowledge I get from discussions, meetings, or working with others (e.g. co-workers, teachers, police officers) is helpful.

[23] I can easily keep in touch with others to communicate about their experiences, knowledge, and stories about work.

usefulness of the information (Kraemer, et al., 1993). Individually perceived approachability of information source has a positive effect on knowledge sharing (Andrews and Delahaye, 2000). These arguments can be applied to relationships among dimensions of tacit knowledge sharing.

Tacit knowledge sharing is hypothesized to affect explicit knowledge sharing positively. According to Smith (2001) and Nonaka and Von Krogh (2009), tacit knowledge positively affects explicit knowledge in the conversion of tacit knowledge into explicit knowledge. Tacit and explicit knowledge can expand through the conversion process (Nonaka, 1994).

Again, tacit knowledge sharing was included in three sets of hypotheses. (See Table 3-2.)

Table 3-2: Hypotheses about Tacit Knowledge Sharing

H4-a1: As the time devoted to tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H4-a2: The time devoted to tacit knowledge sharing affects changes in foster care rates.
H4-b: As time devoted to tacit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.
H5-a1: As the usefulness of tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H5-a2: The usefulness of tacit knowledge sharing will affect changes in foster care rates.
H5-b: As the usefulness of tacit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.
H6-a1: As access to tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H6-a2: Access to tacit knowledge sharing affects changes in foster care rates.
H6-b: As access to tacit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.

b. Individual factors

Competitive performance depends not only on how much firms know, but also on how they use what they know (Haas and Hansen, 2005). Knowledge sharing with other workers within organizations and with those in outside entities is expected to be connected to improved program performance. According to many studies, organizational performance (including program performance) is affected by individual and organizational factors or a combination of several elements (Brewer and Walker, 2010; Lynn, et al., 2001; Pandey, Coursey, and Moynihan, 2007; Rainey and Steinbauer, 1999). Knowledge is human-oriented and sensitive to surrounding environments. Individual and organizational variables may affect whether and how individuals in organizations share knowledge with each other and with those outside the organizations. Thus I hypothesized that the relationship between knowledge sharing and program performance would be affected by individual factors[24] and organizational factor. Such factors can play roles as intervening variables between knowledge sharing and program performance.

- **Public service motivation**

Several individual factors may affect program performance. First, I hypothesized that caseworkers' public service motivation would affect the relationship between knowledge sharing and program performance. Public service motivation can be defined as "an individual's predisposition to respond to motives grounded primarily or uniquely in public institutions and organizations" (Perry and Wise, 1990). Kim (2005) finds that public service motivation had a

[24] This study examines public service motivation and self-set goal as individual factors. Even though the two variables are related to knowledge sharing and public service performance, they have been subject to little study.

positive effect on performance in government organizations. Brewer and Selden (2000) also show that public service motivation positively affects organizational performance. As well, Rainey and Steinbauer (1999) emphasize work motivation through mission valence, which can have a positive impact on organizational effectiveness. According to Lesser and Storck (2010), the field in which one works provides members with a sense of identity that determines how an individual directs his or her attention. Individuals working in public services can be affected by a sense of identity with the public service, which may be associated with program performance.

The CPS program is important in helping vulnerable children. It is likely that CPS staffers will identify with the public service and with the CPS mission (or at least so report on surveys). Therefore, they may try to use knowledge acquired from others to improve program performance. To measure the public service motivation of CPS caseworkers, I adapted questions from Kim (2005).[25] The survey included three questions on public service motivation: "The work I do as a CPS staff member is very important to me," "I am not afraid to go to bat for the rights of others even if it means I will be ridiculed," "Making a difference in society means more to me than my own personal achievements." Survey questions tapped public service motivation, using 7 point scales.[26]

- **Self-set goals**

[25] Kim (2005) uses some questions with a five-point scale to measure public service motivation. For example, "The work I do as a civil servant on my job is very important to me," "I am not afraid to go to bat for the rights of others even if it means I will be ridiculed," "Making a difference in society means more to me than personal achievements," and "I am prepared to make enormous sacrifices for the good of society."

[26] For public service motivation, response options were: 1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, and 7) strongly disagree.

The second individual factor to affect the hypothesized relationship between knowledge sharing and program performance is self-set goals. According to goal setting theory, goals encourage individuals to accomplish higher levels of performance (Locke and Latham, 2002). Quigley et al. (2007) test the interaction effect of self-set goals and knowledge sharing on individual performance as well as the direct effect of self-set goals on individual performance. They show that the relationship between knowledge sharing and individual performance can be affected by the nature of individual self-set goals. Gupta and Govindarajan (2000) also argue that aspiration levels can help individuals achieve higher task performance. Therefore, employees with higher and clearer self-set goals are more likely to try to connect knowledge sharing to program performance. To measure the degree of self-set goals among CPS caseworkers, I modified questions from Quigley et al. (2007)[27] and White (2002).[28] I used three questions to measure self-set goals: "I understand exactly what I am supposed to do as a CPS staffer," "The goals I set for my work are challenging," and "I have specific and clear goals to aim for as a CPS staffer." Survey questions tapped self-set goals, using 7 point scales.[29]

However, the six items tapping public service motivation and self-set goals were highly correlated with each other. After factor analysis, I generated one composite variable called

[27] Quigley et al. (2007) used a question to measure the level of self-set goals: "What is the lowest percent of market share for your unit that you would be satisfied with getting by year 8?"

[28] White (2002) measured student goal-setting for academic achievement. For example, "I understand exactly what I am supposed to do as a student," "The academic goals I have are challenging," "I have specific and clear goals to aim for as a student," "I get credit and recognition when I attain academic goals," "I feel proud when I get feedback indicating I have achieved my academic goals."

[29] For self-set goals, response options were: 1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, and 7) strongly disagree.

personal motivation from the six survey items. I hypothesized four relationships between personal motivation and CPS program performance[30] as well as between personal motivation and the usefulness of knowledge sharing. (See Table 3-3.)

Table 3-3: Hypotheses about Personal Motivation

H7-a1: As personal motivation increases, child abuse or neglect rates will decrease.
H7-a2: Personal motivation will affect changes in foster care rates.
H7-b1: Personal motivation will have a positive effect on time devoted to explicit knowledge sharing.
H7-b2: Personal motivation will have a positive effect on the usefulness of explicit knowledge sharing.
H7-b3: Personal motivation will have a positive effect on access to explicit knowledge sharing.
H7-c1: Personal motivation will have a positive effect on time devoted to tacit knowledge sharing.
H7-c2: Personal motivation will have a positive effect on the usefulness of tacit knowledge sharing.
H7-c3: Personal motivation will have a positive effect on access to tacit knowledge sharing.

c. Organizational factor: red tape

Many studies find that organizational factors affect organizational performance (Brewer and Selden, 2000; Lynn, et al., 2001; Pandey, et al., 2007; Rainey and Steinbauer, 1999). One such factor is "red tape." Red tape refers to excessive regulations or over-conformity to formal

[30] Like the relationship between knowledge sharing and changes in foster care rates, the direction of the effect of personal motivation on the changes in foster care rates cannot be specified, even though personal motivation is hypothesized to be associated with changes in foster care rates.

rules. It consists of "burdensome" administrative rules and requirements (Rainey, 2003). Many studies emphasize that red tape negatively affects governmental performance (Bozeman, Reed, and Scott, 1992; Rainey, Pandey, and Bozeman, 1995; Walker and Brewer, 2009). Bozeman, Reed and Scott (1992) regard red tape as excessive rules and task delays, which can result in reducing organizational performance. Similarly, Pandey, Coursey, and Moynihan (2007) argue red tape reduces the effectiveness of organizations. The United States national government has tried to reduce red tape since the 1970s (Brewer and Walker, 2010). Also, Brewer and Selden (2010) show a negative impact on organizational performance, even though the relationship between red tape and organizational performance is statistically insignificant. New ideas and skills gained through knowledge sharing can be blocked or delayed by excessive paperwork, rules, or procedures. In addition, according to Bozeman and Kingsley, organizations with higher levels of red tape tend to avoid a "risk culture" (Bozeman and Kingsley, 1998)[31] Employees in organizations with higher levels of red tape are likely to prefer following standard operating procedures to pursuing finding new or creative ways that can use more knowledge in their duties.

CPS staffers face different types of child abuse or neglect. Even though the cases that they deal with fall into categories such as physical abuse or neglect, sexual abuse, medical neglect, or psychological maltreatment (JLARC, 2005), each category contains diverse reasons, situations, and contexts. Differing cases may require CPS staffers to respond differently. New ideas about or approaches to unusual cases through shared knowledge may help workers

[31] A "risk culture" is a culture that may encourage risk taking for achieving organizational goals (Bozeman and Kingsley, 1998).

decide on such responses. Excessive rules, regulations, and procedures, however, may restrict the use of creative ideas that fit diverse and unusual cases, because CPS staffers have to follow formal and standardized rules. In addition, CPS staffers are unlikely to be willing to use creative ways that are gained by sharing knowledge with others if they work under highly redundant rules or regulations. Therefore, I hypothesize that "red tape" is likely to have a negative impact on the relationship between knowledge sharing and program performance.[32]

To measure the degree of red tape,[33] I modified questions from Brewer and Walker (2010) and Pandey et al. (2007) to adapt them to my study.[34] Five survey questions tapped red tape. Questions included: 1) communication within my agency is too restricted by policies and procedures, 2) communication with outside organizations such as schools, police departments, or hospitals is too restricted by policies and procedures, 3) the budgeting rules and procedures limit CPS workers' ability to deal with unexpected problems, 4) too many documents and procedures are involved in reporting on each case, 5) rules and procedures make it difficult to use new ideas to handle cases. Survey questions tapped red tape, using 7 point scales.[35]

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[32] There is little study of the effect of red tape on knowledge sharing, even though some work has examined the effect of red tape on program performance. I hypothesize that organizational factors can affect knowledge sharing.

[33] Red tape was measured by the degree of red tape individual respondents perceived in their organizations. This is consistent with Pandey et al. (2007) and Brewer and Walker (2010) who also used individuals' perceptions to tap the extent and nature of red tape.

[34] Brewer and Walker (2010) used two overall measures of red tape (internal and external) and three sub-system measures of red tape. Pandey et al. (2007) also measured five types of red tape (human resources, procurement, information systems, budget, and communication red tape).

[35] For red tape, response options were: 1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, and 7) strongly disagree.

The five items on red tape were highly correlated with each other. After factor analysis, I generated one composite variable, red tape. The new variable appeared in several hypotheses. (See Table 3-4.)[36]

Table 3-4: Hypotheses about Red Tape

H8-a1: As red tape increases, child abuse or neglect rates will increase.
H8-a2: Red tape will affect changes in foster care rates.
H8-b1: Red tape will have a negative effect on time devoted to explicit knowledge sharing.
H8-b2: Red tape will have a negative effect on the usefulness of explicit knowledge sharing.
H8-b3: Red tape will have a negative effect on access to explicit knowledge sharing.
H8-c1: Red tape will have a negative effect on time devoted to tacit knowledge sharing.
H8-c2: Red tape will have a negative effect on the usefulness of tacit knowledge sharing.
H8-c3: Red tape will have a negative effect on access to tacit knowledge sharing.

3.3.3. Control variables

Besides knowledge sharing, program performance can be affected by other factors. The CPS program also may be affected by factors such as local economic conditions, staff professionalism (educational levels, tenure, work-related training, and family assessments), and available financial resources (increases/decreases in program budgets).

[36] I did not predict the direction of the effect of red tape on changes in foster care rates, even though red tape is hypothesized to be related to changes in foster care rates.

a. Economic conditions

The economic condition of the family can be regarded as a risk factor for child abuse. According to a study by Zuravin and Greif (1989), poverty is strongly related to child neglect. Gelles (1989) argues that economic deprivation is positively associated with child abuse. Financial stress on households, such as low income and unemployment, has a positive impact on child maltreatment (Ards, 1992; Paxson and Waldfogel, 2003). In addition, decreases in economic support such as Medicaid funding as well as general economic conditions, such as lower average incomes and higher unemployment, also are positively related to child maltreatment (Bitler and Zavodny, 2004). Since the degree of child maltreatment (child abuse or neglect) is an indicator of CPS program performance, local economic conditions are hypothesized to be closely related to the performance of the Child Protective Services program. Since privacy laws prevented me from having access to information about individual cases, I used the median household income and the local unemployment rate as indicators of local economic conditions. (See Table 3-5.)

Table 3-5: Hypotheses about Economic Conditions

H9-a1: As median household income increases, child abuse or neglect rates will decrease.
H9-a2: As median household income increases, foster care rates will decrease.
H9-b1: As unemployment rates increase, child abuse or neglect rates will increase.
H9-b2: As unemployment rates increase, foster care rates will increase.

b. Staff professionalism[37]

The professionalism of workers also can enhance organizational performance (Rainey and Steinbauer, 1999). Staff professionalism may be tapped by a variety of indicators, including level of formal education, work experience, work training, and family assessments.

First, by examining the effect of managerial quality on program performance, Meier and O'Toole (2002) emphasize public school superintendents' quality, which includes their educational levels. Avellaneda (2009) finds that mayoral qualifications, such as education, can positively affect municipal performance. The survey measured the educational levels of CPS staffers.

Second, professionalism also can be gained by work experience. It is likely that staffers with more experience will have more expertise than those with less experience. Meier and O'Toole (2002) and Avellaneda (2009) also show that work or job-related experience positively affected program performance. Here, the number of years that staffers reported they had been CPS staffers tapped work experience.

Third, specialized skills often require work-related training. CPS staffers have professional skills and expertise to deal with a variety of situations. Training can improve their skills and expertise, which in turn can improve program performance. Iddekinge et al. (2009)

[37] The direction of the effect of staff professionalism on changes in foster care rates cannot be identified, even though staff professionalism is hypothesized to be related to changes in foster care rates.

find that job-related training has a positive effect on performance. The frequency of reported work-related training was used as a measure of professionalism.

Fourth, in CPS programs, family assessments are a different track from investigations, even though they include many of the same procedures (JLARC, 2005). The purpose of family assessments is to find and educate families that are likely to abuse or neglect children, which eventually results in protecting children from abusive or neglectful situations. Family assessments are related to staffers' professionalism, because the results of family assessments depend on how families that have high possibility for abusing or neglecting children participate in family assessments. The CPS staffers in family assessments play critical roles in encouraging the family to become actively involved in the process and to build on existing family strengths. Depending on CPS staffers' professionalism, the frequency of family assessments may vary. Therefore, family assessments from 2007 to 2008 were hypothesized to be positively associated with CPS program performance from 2007 to 2009. (See Table 3-6.)

Table 3-6: Hypotheses about Staff Professionalism

H10-a1: As the degree of education of CPS staffers increases, child abuse or neglect rates will decrease.
H10-a2: Variation in the degree of education of CPS staffers will affect changes in foster care rates.
H10-b1: As the work experience of CPS staffers increases, child abuse or neglect rates will decrease.
H10-b2: Variation in the work experience of CPS staffers will be related to changes in foster care rates.
H10-c1: As frequency of training of CPS staffers increases, child abuse or neglect rates will decrease.

H10-c2: The frequency of CPS work training of CPS staffers will affect changes in foster care rates.
H10-d1: As family assessments increase, child abuse or neglect rates will decrease.
H10-d2: Changes in family assessments will be related to changes in foster care rates.

c. Financial resources[38]

Another important factor in explaining program effectiveness is the availability of financial resources. Few program goals can be achieved without at least minimal levels of funding. Ari finds that higher funding levels had a positive effect on program performance (Ari, 2005). Similarly, Rainey and Steinbauer (1999) regard financial resources as one of the factors that influence the effective performance of government organizations. According to a study by Sandfort, Selden, and Sowa (2008), grants as a government tool had the most significant and positive effects on program performance. In the child welfare area, resource shortages can restrict the activities of caseworkers, which can result in putting children in need of welfare services on waiting lists (B. Smith and Donovan, 2003). Therefore, the level of financial resources available is likely to be positively associated with program performance. In this study, financial resources were measured by annual local expenditures on social welfare services.[39] (See Table 3-7.)

[38] Once more, the direction of the effect of financial resources on changes in foster care rates cannot be identified, even though financial resources are hypothesized to affect change in foster care rates.

[39] According to the Joint Legislative Audit and Review Commission (2005), exact funding amounts for the CPS program were unknown. However, JLARC estimated the funding allocated to CPS by using a federal cost allocation

Table 3-7: Hypotheses about Financial Resources

Hypotheses
H11a: As CPS program expenditures increase, child abuse or neglect rates will decrease.
H11b: Changes in CPS program expenditures will be related to changes in foster care rates.

Table 3-8 summarizes all of the hypotheses tested. The next section describes how I tested these hypotheses, examining data collection and analysis, the unit of primary analysis, and the limitations of the study.

Table 3-8: Summary of Proposed Hypotheses

H1-a1: As the time devoted to explicit knowledge sharing increases, child abuse or neglect rates will decrease.
H1-a2: The time of explicit knowledge sharing will affect changes in foster care rates.
H1-b: As the time devoted to explicit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.
H2-a1: As usefulness of explicit knowledge sharing increases, child abuse or neglect rates will decrease.
H2-a2: Usefulness of explicit knowledge sharing will affect changes in foster care rates.
H2-b: As usefulness of explicit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.
H3-a1: As access to explicit knowledge sharing increases, child abuse or neglect rates will decrease.

methodology, called random moment sampling (RMS). Based on this methodology, JLARC and VDSS annual reports estimated that child welfare used around 30 percent of social welfare. Therefore, this study also used the estimated funding amounts of the CPS program to measure the financial resources variable for each of the local agencies.

H3-a2: Access to explicit knowledge sharing affects changes in foster care rates.
H3-b: As access to explicit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.
H4-a1: As the time devoted to tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H4-a2: The time devoted to tacit knowledge sharing affects changes in foster care rates.
H4-b: As time devoted to tacit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.
H5-a1: As the usefulness of tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H5-a2: The usefulness of tacit knowledge sharing will affect changes in foster care rates.
H5-b: As the usefulness of tacit knowledge sharing increases, the usefulness of explicit knowledge sharing will increase.
H6-a1: As access to tacit knowledge sharing increases, child abuse or neglect rates will decrease.
H6-a2: Access to tacit knowledge sharing affects changes in foster care rates.
H6-b: As access to tacit knowledge sharing increases, the usefulness of tacit knowledge sharing will increase.
H7-a1: As personal motivation increases, child abuse or neglect rates will decrease.
H7-a2: Personal motivation will affect changes in foster care rates.
H7-b1: Personal motivation will have a positive effect on time devoted to explicit knowledge sharing.
H7-b2: Personal motivation will have a positive effect on the usefulness of explicit knowledge sharing.
H7-b3: Personal motivation will have a positive effect on access to explicit knowledge sharing.
H7-c1: Personal motivation will have a positive effect on time devoted to tacit knowledge sharing.
H7-c2: Personal motivation will have a positive effect on the usefulness of tacit knowledge sharing.

H7-c3: Personal motivation will have a positive effect on access to tacit knowledge sharing.
H8-a1: As red tape increases, child abuse or neglect rates will increase.
H8-a2: Red tape will affect changes in foster care rates.
H8-b1: Red tape will have a negative effect on time devoted to explicit knowledge sharing.
H8-b2: Red tape will have a negative effect on the usefulness of explicit knowledge sharing.
H8-b3: Red tape will have a negative effect on access to explicit knowledge sharing.
H8-c1: Red tape will have a negative effect on time devoted to tacit knowledge sharing.
H8-c2: Red tape will have a negative effect on the usefulness of tacit knowledge sharing.
H8-c3: Red tape will have a negative effect on access to tacit knowledge sharing.
H9-a1: As median household income increases, child abuse or neglect rates will decrease.
H9-a2: As median household income increases, foster care rates will decrease.
H9-b1: As unemployment rates increase, child abuse or neglect rates will increase.
H9-b2: As unemployment rates increase, foster care rates will increase.
H10-a1: As the degree of education of CPS staffers increases, child abuse or neglect rates will decrease.
H10-a2: Variation in the degree of education of CPS staffers will affect changes in foster care rates.
H10-b1: As the work experience of CPS staffers increases, child abuse or neglect rates will decrease.
H10-b2: Variation in the work experience of CPS staffers will be related to changes in foster care rates.

H10-c1: As frequency of training of CPS staffers increases, child abuse or neglect rates will decrease.
H10-c2: The frequency of CPS work training of CPS staffers will affect changes in foster care rates.
H10-d1: As family assessments increase, child abuse or neglect rates will decrease.
H10-d2: Changes in family assessments will be related to changes in foster care rates.
H11a: As CPS program expenditures increase, child abuse or neglect rates will decrease.
H11b: Changes in CPS program expenditures will be related to changes in foster care rates.

3.4. Data collection and analysis

3.4.1. Data collection

In order to test the hypotheses about the influences on program performance, first, I collected data from several sources on-line as well as by hand. The Virginia Department of Social Services (VDSS) provides statistical data, commission reports, and performance reviews on its web-homepage. For example, for each year, the VDSS reported the rates of abuse or neglect per 1000 children and foster care numbers on its homepage. Those data were used to measure CPS program performance in each of the local jurisdictions. The data tapping local economic conditions (median household income and unemployment rate) were collected from the U.S Census Bureau[40] and the U.S Department of Labor.[41] The data on financial resources (CPS program expenditures) were collected from the Virginia auditor of public accounts.[42]

[40] http://www.census.gov/did/www/saipe/data/statecounty/data/2008.html

[41] http://www.bls.gov/lau

[42] http://www.apa.virginia.gov/LocalGovernment/ComparativeReportarchive.cfm

Second, the data for each of the independent variables -- explicit and tacit knowledge sharing, individual public service motivation, red tape, staff professionalism (degree of education, period of work as a CPS staffer, whether the respondent was a social worker or a supervisor, and frequency of CPS work training)-- were collected from CPS staffers in 23 local departments of social or human services in Virginia through a web-based survey.

Many counties and cities in Virginia have relatively few CPS social workers. Due to the characteristics of knowledge sharing, I chose only workers in counties and cities with 10 or more CPS social workers (including caseworkers and supervisors.) Thirty-six counties and cities met this criterion. Before doing the survey, I did preliminary interviews with CPS staffers working for one of the local agencies that was not included in the sample.[43] I got a better sense of possible relationships between knowledge sharing and CPS program performance.

After IRB approval of the survey (see appendix A), I received permission to administer the survey from the directors of 23 of the 36 departments of local social services. It was difficult to get such permission. Some accepted my survey plan, but others declined to allow me to administer the survey either explicitly or by not responding to repeated requests. After receiving permission, I sent survey links either to the CPS program staffers directly or through

[43] These pre-survey interviews affected the survey questions and design in some aspects. First, the interviews gave me confidence about the possible effects of knowledge sharing on improved capability to deal with situations in the public program area. Second, I got some sense that the distinction between explicit knowledge sharing and tacit knowledge sharing was meaningful in this setting, because CPS staffers got much information and know-how by meeting and talking with each other and used the information in handling their tasks. Third, I had thought that tacit knowledge sharing would have more effects on performance than explicit knowledge sharing, because CPS staffers spent considerable time sharing tacit knowledge. However, the results based on the study suggest that tacit knowledge sharing had an indirect effect on program performance. Summaries of the pre-survey interviews appear in Appendix C.

the supervisors of the local CPS programs. The period to respond to the survey was from June 18 through September 11, 2010. CPS staffers including supervisors and caseworkers in the 23 local agencies in Virginia participated in the survey. The total number of social workers who were asked to complete the survey in these 23 jurisdictions was 258. Ultimately, 116 staffers participated in the survey, but because two did not indicate their jurisdictions, 114 survey responses were usable. The response rate was almost 45%.

The survey included questions about the degree of knowledge sharing among employees in each organization, and the individual and organizational conditions in which supervisors and caseworkers worked.

3.4.2. Data analysis

In analyzing these data to address the research questions, first, at the jurisdictional level I used descriptive statistics and regression analysis. Second, at the individual level the data were analyzed to examine relationships between explicit and tacit knowledge sharing, individual, organizational, and alternative explanatory factors, and CPS program performance, primarily using factor and multiple regression analyses.[44] Factor analysis was used to reduce some highly correlated variables, generated composite measures.[45] For example, as mentioned earlier, survey items about the degree of knowledge sharing and the helpfulness of knowledge sharing were highly correlated with each other. Items on public service motivation and self-set

[44] The dependent variables were continuous, making OLS regression appropriate. In my judgment the independent variables, although mostly ordinal, had sufficient categories and variation to warrant using regression.

[45] According to Bartholomew et al. (2008), a concept often has multi-dimensional aspects. Several observed items, then, are needed to reflect a concept.

goals and the red tape survey questions also were highly correlated with each other. Step-wise regression analysis helped identify changes in the total amount of dependent variables explained by the independent variables by the addition of new variables as well as variation in the isolating effects of the added variables.

Lastly, the data were analyzed using path analysis. As one of several multistage models with one or more exogenous variables and two or more endogenous variables (Pedhazur and Schmelkin, 1991), path analysis helps investigate the causal patterns hypothesized among variables (Bartholomew, Steele, Moustaki, and Galbraith, 2008). As this study sought to identify the causal relationships among knowledge sharing, individual and organizational factors, and CPS program performance, path analysis was appropriate. It tested various causal paths as well as showed total effects by disentangling the direct and the indirect effects on the primary dependent variables.

3.5. Unit of analysis

The study focused on two different units of analysis: the local jurisdiction and the individual survey respondent. First, it examined the relations between various factors and CPS program performance at the jurisdictional level. At the jurisdictional level the effects on CPS program performance of economic conditions and financial resources in all of the 134 local jurisdictions in Virginia as well as in the 23 jurisdictions that participated in this study were examined. However, the study focused primarily on survey responses tapping individual workers' views and characteristics, their localities' economic conditions and their agencies' financial resources, and CPS program performance in the 23 local jurisdictions. Nonetheless,

the reasons for examining economic conditions, financial resources, and CPS program performance in all 134 jurisdictions are several. By comparing these with those of the 23 jurisdictions from which survey responses were received, one can see whether and how the two differ. In addition, the effects of economic conditions and financial resources on CPS program performance at the jurisdictional level can be identified; for many, these are likely to be the expected influences on variations in CPS program performance.

Second, the study also examined the influences on CPS program performance at the individual level, looking at the effects of reported explicit and tacit knowledge sharing by individual CPS staffers, the dynamics of explicit and tacit knowledge sharing, and individual and organizational factors.

3.6. Limitations

This study has several limitations. First are data limitations. The cross-sectional survey data were compared with data on multi-year program performance to examine several hypothesized relationships. That means that one time survey results were compared with multi-year program performance indicators.[46] This limitation was overcome to some degree by using multi-year data on economic conditions and financial resources.

Second, case study research has limited generalizability. The study yielded results that are hard to generalize to other states, to other Virginia localities or to other government programs. However, the study examined the relationships between CPS program performance

[46] Program performance data are used for periods ranging from 2007 through 2009 for rates of child abuse or neglect per 1000 children and the numbers of children in foster care. They can be compared to similar data going back to 2000 in Appendix E.

and economic conditions and CPS program expenditures in all jurisdictions in Virginia as well as in the 23 jurisdictions and compared the results of the relationships between the two to check for selection bias. Similar directions of effects of economic conditions and program expenditures on program performance suggest that the results of the survey data from the 23 jurisdictions indicate that the localities are representative. In addition, as Yin (2009) argues, this study may produce "analytic generalization," if not "statistical generalization."[47] Even though the results of the study cannot be generalized to other states or to other Virginia localities or state government programs, they may help in gauging the broader applicability of the theoretical propositions on knowledge sharing and program performance.

Summary

This chapter discussed the study design and methods. The conceptual framework was established in three steps. The first step showed the relationships between knowledge sharing and program performance as well as between explicit and tacit knowledge sharing. The second step showed the effects of intervening variables (individual and organizational factors) on the relationship between knowledge sharing and program performance. The last step added alternative explanatory factors.

The CPS program was selected to examine the relationship between program performance and knowledge sharing, individual, organizational, and alternative explanatory factors. Then, based on the conceptual framework, the dependent and the independent

[47] Yin (2003) explains that "analytic generalization" seeks to expand and generalize theories, and "statistical generalization" emphasizes the generalizability of empirical findings.

variables were described and operationalized in order to test several hypotheses. How the data used to test those hypotheses were collected and analyzed was described and the limitations of the study were discussed. Attention turns next to the findings.

CHAPTER 4 Analysis and Findings

This chapter presents the findings of testing the hypothesized relationships between CPS program performance and explicit and tacit knowledge sharing, individual and organizational factors, and alternative explanatory factors. First, it will briefly describe the data on CPS program performance and the independent variables, giving a general overview of the individual and jurisdictional evidence related to knowledge sharing and the potential influences of individual, organizational, and external factors. Second, attention turns to the analyses of the relationships among the variables at the jurisdictional level by comparing all localities in Virginia to the 23 jurisdictions whose CPS staffers participated in the survey. Third, the causal relationships among variables at the individual level will be analyzed. Fourth, drawing on those survey responses, direct and indirect causal relationships among the variables will be examined using path analysis. Lastly, by returning to knowledge sharing at the jurisdictional level, its effects on CPS program performance in the 23 jurisdictions will be examined more deeply, by looking at several specific localities.

4.1. Descriptive analysis

Discussion begins by providing an overview of the findings on the dependent and independent variables.[48]

[48] A table of bivariate correlations for all variables included in the study appears in Appendix D.

4.1.1. Dependent variables

This study uses two variables to measure CPS program performance: changes in child abuse or neglect rates and in foster care rates from 2007 to 2009.[49] The Virginia Department of Social Services reports the child abuse or neglect rates and the numbers of children in foster care for each of the 134 counties and cities in Virginia each year.

a. Change in child abuse or neglect rates

As chapter 3 reported, officials from 23 jurisdictions participated in the survey portion of the research. Child abuse or neglect rates in all jurisdictions in Virginia increased somewhat between 2007 and 2009, but child abuse or neglect rates in the 23 local jurisdictions decreased slightly. (See table 4-1.) Yet, the overall differences are quite small, suggesting on this variable that the 23 jurisdictions examined in depth here were fairly typical of localities throughout the state.

Table 4-1: Changes in Child Abuse or Neglect Rates, 2009-2007

	all jurisdictions in Virginia	23 jurisdictions	other jurisdictions
Mean	0.23	-0.09	0.32
Std. Deviation	2.93	2.41	3.06
Minimum	-10.15	-5.60	-10.15
Maximum	9.78	6.90	9.78

Source: Virginia Department of Social Services (VDSS)

b. Change in foster care rates

[49] There was a trend of gradual decline in child abuse/neglect rates between 2000 and 2006. However, in 2006 child abuse/neglect rates increased somewhat. It is possible that child abuse/neglect rates were affected by economic conditions. Thus it is reasonable to examine CPS program performance after 2006. Child abuse/neglect rates from 2000 through 2009 are reported in Appendix E.

Changes in foster care rates between 2007 and 2009 in all jurisdictions and in the 23 jurisdictions also can be compared. (See table 4-2.) The results from all jurisdictions and the 23 jurisdictions clearly are different. However, the pattern of the two results is similar: the rates of children in foster care increased in both; again, the 23 jurisdictions do not include the extreme on the variable.

Table 4-2: Changes in Foster Care Rates, 2009-2007

	all jurisdictions in Virginia	23 jurisdictions	other jurisdictions
Mean	11.25	0.14	10.81
Std. Deviation	61.05	3.32	59.47
Minimum	-141.46	-8.53	-141.46
Maximum	432.53	11.15	432.53

Source: Virginia Department of Social Services (VDSS)

4.1.2. Independent variables

The study examined several variables as possible explanations for CPS program performance. It will be recalled that the independent variables included in the analysis in the 23 jurisdictions with survey respondents are explicit and tacit knowledge sharing, public service motivation, self-set goals, red tape, changes in economic conditions, staffers' professionalism, and changes in programs' financial resources.[50]

a. Explicit and tacit knowledge sharing (survey items)

Four survey questions tapped explicit and tacit knowledge sharing. The items tapped the time devoted to, degree of, and helpfulness of explicit and tacit knowledge sharing, as well as reported access to explicit and tacit knowledge. (See Table 4-3.)

[50] Descriptive statistics on respondents are in Appendix F.

On average the CPS staffers reported sharing explicit knowledge once or twice a day and tacit knowledge almost once daily. Second, the CPS staffers in the 23 jurisdictions agreed that they find and share know-how, information, and knowledge through explicit as well as more implicit means. CPS staffers also agreed that sharing explicit and tacit knowledge is helpful in dealing with their work. When the degree and helpfulness of explicit and tacit knowledge sharing are compared, the averages for tacit knowledge sharing are higher.

Third, the average CPS staffer reported that they can easily access both explicit and tacit knowledge. When comparing responses on explicit knowledge sharing with those on tacit knowledge sharing, generally CPS staffers reported that they use and share tacit knowledge more than explicit knowledge.

Table 4-3: Explicit and Tacit Knowledge Sharing[51]

	Mean	Std. Deviation	Mode
Time devoted to Explicit Knowledge Sharing	2.34	1.00	2.00
Time devoted to Tacit Knowledge Sharing	2.87	0.93	3.00
Degree of Explicit Knowledge Sharing	5.89	1.28	7.00
Helpfulness of Explicit Knowledge Sharing	5.94	1.12	6.00
Access to Explicit Knowledge Sharing	5.86	1.26	6.00
Degree of Tacit Knowledge Sharing	6.30	0.93	7.00
Helpfulness of Tacit Knowledge Sharing	6.37	0.95	7.00
Access to Tacit Knowledge Sharing	6.07	1.01	6.00

[51] The survey questions about the degree and helpfulness of and access to explicit and tacit knowledge sharing used a seven point Likert scale: 1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, 7) strongly disagree. I reversed the order of the responses to more clearly present the results. The question about the time spent in explicit knowledge sharing used a four point scale: 1) rarely if ever, 2) once or twice a day, 3) 3-5 times a day, 4) 6 times or more. The question about the time spent in tacit knowledge sharing also used a four point scale: 1) less than once a week, 2) once or twice a week, 3) 4-5 times a week (almost once every day), 4) more than six times a week (more than once every day).

b. Public service motivation, self-set goals, and red tape

Individual (public service motivation and self-set goals) and organizational (red tape) factors are intervening variables in the analysis. (See Table 4-4.) They were measured by three items tapping public service motivation (for public service job, public good, and public service) and three items measuring aspects of the self-set goals of CPS staffers (self-set goals about work, difficulty of self-set goal achievement, and clarity of self-set goals). Five items tapped reports of organizational red tape (red tape within organizations, with outside organizations, about budgeting, with reporting documents, and about new ideas).

The CPS staffers in the 23 jurisdictions reported high levels of motivations for public service jobs, public good, and public service. (See Table 4-4.) Similarly, they reported high levels of self-set goals.

In contrast, the responses about red tape showed more variation. The staffers perceived the degree of red tape differently depending on the function or activity. The levels of red tape reported within agencies and in dealing with outside organizations were lower than those of red tape in budgeting, reporting documents, and pursuing new ideas.

Table 4-4: Public Service Motivation, Self-set Goals, and Red tape[52]

	Mean	Std. Deviation	Mode
Motivation for Public Service Job	6.53	0.73	7.00
Motivation for Public Good	6.42	0.78	7.00

[52] All of these survey questions asked respondents to choose from a seven point Likert scale: 1) strongly agree, 2) agree, 3) agree somewhat, 4) neither agree nor disagree, 5) disagree somewhat, 6) disagree, 7) strongly disagree. I again reversed the order of the responses, so that higher numbers indicate more agreement.

Motivation for Public Service	5.80	1.13	6.00
Self-set Goal about Work	6.27	0.92	7.00
Hardness of Self-set Goal Achievement	6.29	0.79	7.00
Clearness of Self-set Goal	6.03	0.98	6.00
Red tape within Organizations	3.77	1.74	2.00
Red tape with Outside Organizations	3.68	1.66	2.00
Red tape about Budgeting	5.02	1.76	7.00
Red tape of Reporting Documents	4.91	1.63	5.00
Red tape about New ideas	4.47	1.62	5.00

c. Alternative explanatory factors

The analysis also includes three alternative explanatory variables for variations in CPS performance. Economic conditions are tapped by changes in localities' median household income and in unemployment rate from 2007 to 2008. Staffers' professionalism was measured by several items: respondents' education; length of tenure as a CPS staffer, a social worker, or supervisor; the frequency of CPS work training; and changes in jurisdictions' numbers of family assessments between 2007 and 2008. Changes in CPS program expenditures from 2007 to 2008 tapped available financial resources.

Table 4-5 provides a portrait of the reported professionalism of the respondents. Most survey respondents had a 4 year college degree or more, and have worked for 6 to 15 years as a CPS staffer or for fewer than 10 years as a supervisor. They have attended CPS work training 11-20 times. Table 4-6 compares changes in the economic conditions, CPS program expenditures, and numbers of family assessments between 2007 and 2008 for all 134 local jurisdictions to those in the 23 jurisdictions focused on here. Between 2007 and 2008, median household income rose more than $1400 in all jurisdictions and $1750 in the 23 localities. Over the same

period, the unemployment rates rose more than 1%. Local CPS program expenditures increased $258,000 across all 134 jurisdictions but by more than $577,000 in the 23 focal jurisdictions. Family assessments increased almost 28 times in all jurisdictions in Virginia but more than 46 times in the 23 jurisdictions between 2007 and 2008. Yet, as the standard deviations indicate, there was considerable variation across localities.

Table 4-5: Staffers' Professionalism

	Mean	Standard deviation
Degree of education	3.37	0.50
Tenure as a CPS staffer	2.25	1.42
Tenure as a social worker	2.55	1.41
Tenure as a supervisor	1.42	1.03
Frequency of CPS work training	3.68	1.43

Table 4-6: Changes in Economic Conditions, Financial Resources, and Family Assessments, 2007-2008

	All jurisdictions in Virginia		23 jurisdictions	
	Mean	Standard deviation	Mean	Standard deviation
Change in median household income ($100s) (2008-2007)	$14.43	26.73	$17.56	21.33
Change in unemployment rate (2008-2007)	1.12	0.54	1.02	0.64
Change in CPS program expenditures ($1000s) (2008-2007)	$258.09	629.23	$577.57	516.86
Change in family assessments (2008-2007)	27.96	61.82	46.39	67.14

4.2. Jurisdictional level

Before analyzing the individual-level relationships between knowledge sharing and program performance, the effects of economic conditions, financial resources, and family assessments on CPS program performance are examined at the jurisdictional level. There are two reasons for doing this. First, it permits the effects of local economic conditions, agency financial resources, and family assessments on CPS program performance to be isolated.

Second, by comparing the effects of economic conditions, financial resources, and family assessments on CPS program performance among all local jurisdictions in Virginia with those of the 23 jurisdictions whose staffers participated in the survey, the possibility of selection bias can be checked. For example, if the patterns are similar, the results of looking at survey data from the 23 jurisdictions can be seen to be at least somewhat representative of localities more generally.

4.2.1. All local jurisdictions in Virginia

a. Change in child abuse or neglect rates

Economic conditions, available program funds, and family assessments can be considered to be potentially strong influences on changes in child abuse or neglect rates. All jurisdictions in Virginia were examined to see the possible effects of changes in median household income, unemployment rate, CPS program expenditures, and family assessments between 2007 and 2008 on changes in child abuse or neglect rates between 2007 and 2009.

To compare the effects of each of these factors, I ran a step-wise regression. (See Table 4-7.) Models 1 and 2 are statistically significant at the 90% confidence level. Only the coefficients for the relationship between changes in median household income and in child abuse or neglect rates are statistically significant in the models. And in both cases, the magnitude of the effect is quite weak.

Two points might be noted about these results. First, the relationship between changes in median household income and in child abuse or neglect rates is positive: as median household income increases, rates of child abuse or neglect rates also increase. Even though

the results are different from conventional arguments that median household income and rates of child abuse or neglect are negatively related, it seems possible that this might happen. For example, increases in median household income can be related to more time spent working. If parents or guardians spend more time working, it is possible for children to be neglected. It also could be that those whose incomes increased in a locality were not those with children.

Second, the effects of economic conditions, financial resources, and family assessments on changes in child abuse or neglect rates in Virginia do not appear to be large. The regression results indicate that their joint influences on changes in child abuse or neglect were around 5%. This increases the possibility that other factors such as knowledge sharing among CPS staffers may be associated with changes in child abuse or neglect rates.

Table 4-7: Predicting Changes in Child Abuse or Neglect Rates (all Virginia jurisdictions)

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	Coefficients	S.E.	coefficients	S.E.
(Constant)	-0.313	0.604	-0.024	0.672	-0.169	0.692
Change in median household income ($100s) (2008-2007)	0.023**	0.009	0.024**	0.009	0.024**	0.009
Change in unemployment rate (2008-2007)	0.191	0.469	0.018	0.501	0.087	0.507
Change in CPS program expenditure ($1000s) (2008-2007)			0.000	0.000	-0.001	0.000
Change in family assessments (2008-2007)					0.004	0.005
R^2	0.043*		0.050*		0.056	
Adjusted R^2	0.028*		0.028*		0.026	
F value	2.943		2.285		1.903	
N=134						

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

b. Change in foster care rates

The effects of changes in median household income, unemployment rate, CPS program expenditures, and family assessments from 2007 to 2008 on changes in foster care rates from 2007 to 2009 in all 134 jurisdictions also were examined. To compare the effects of each of these factors, I again ran step-wise regressions. According to the results, model 2 and 3 are statistically significant. Changes in a jurisdiction's median household income, unemployment rate, CPS expenditures, and family assessments together accounted for approximately 17% of the variation in changes in foster care rates. But only the coefficient for the relationship between changes in CPS program expenditures and changes in foster care rates was statistically significant ($p<0.01$). An increase of $ 1,000 in CPS spending is associated with a 4% increase in foster care placement. (See Table 4-8.)

Table 4-8: Predicting Changes in Foster Care Rates (all Virginia jurisdictions)

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	coefficients	S.E.	coefficients	S.E.
(Constant)	31.752	12.696	4.302	13.051	6.322	13.475
Change in median household income ($100s) (2008-2007)	-0.080	0.198	-0.166	0.184	-0.166	0.184
Change in unemployment rate (2008-2007)	-17.283*	9.863	-0.893	9.735	-1.841	9.875
Change in CPS program expenditure ($1000s) (2008-2007)			0.040***	0.008	0.043***	0.009
Change in family assessments (2008-2007)					-0.058	0.093
R^2	0.024		0.171***		0.174***	
Adjusted R^2	0.009		0.152***		0.148***	
F value	1.582		8.965		6.790	
N=134						

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

4.2.2. 23 local jurisdictions

When examining relationships between program performance and economic conditions, financial resources, and family assessments in the 23 local jurisdictions whose staffers

participated in the study, I found similar patterns to those that appeared in all jurisdictions in Virginia. Before analyzing these relationships at the individual level, these similarities will be briefly discussed.

a. Change in child abuse or neglect rates

According to the regression results for the 23 jurisdictions, positive relationships emerged between changes in child abuse or neglect rates and changes in median household income, unemployment rates, and family assessments. These patterns are similar to those in all jurisdictions in Virginia. (See Table 4-9.) Again, the only statistically significant relationship is that with change in median household income.

Table 4-9: Predicting Changes in Child Abuse or Neglect Rates (23 jurisdictions)

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	coefficients	S.E.	coefficients	S.E.
(Constant)	-1.946	1.117	-1.795	1.260	-2.395	1.513
Change in median household income ($100s) (2008-2007)	0.048*	0.024	0.048*	0.024	0.047*	0.025
Change in unemployment rate (2008-2007)	0.991	0.791	1.000	0.810	1.173	0.853
Change in CPS program expenditure ($1000s) (2008-2007)			0.000	0.001	0.000	0.001
Change in family assessments (2008-2007)					0.006	0.008
R^2	0.186		0.189		0.213	
Adjusted R^2	0.104		0.061		0.038	
F value	2.279		1.476		1.217	
N=23						

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

b. Change in foster care rates

None of the regression models examining influences on changes in foster care rates in the 23 focal localities is statistically significant. However, the directions of the relationships

between changes in foster care rates and changes in median household income, unemployment rate, CPS program expenditures, and family assessments in the 23 jurisdictions also are similar to those in all jurisdictions in Virginia. For example, changes in foster care rates were negatively associated with changes in median household income and in unemployment rate. On the other hand, changes in foster care rates were positively related to changes in CPS program expenditures. These patterns are similar to those for all 134 jurisdictions in Virginia. (See Table 4-10.)

Table 4-10: Predicting Changes in Foster Care Rates (23 jurisdictions)

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	coefficients	S.E.	coefficients	S.E.
(Constant)	2.169	1.620	1.843	1.823	0.667	2.161
Change in median household income ($100s) (2008-2007)	-0.045	0.035	-0.045	0.035	-0.048	0.035
Change in unemployment rate (2008-2007)	-1.219	1.147	-1.239	1.172	-0.899	1.219
Change in CPS program expenditure ($1000s) (2008-2007)			0.001	0.001	0.001	0.001
Change in family assessments (2008-2007)					0.012	0.012
R^2	0.099		0.108		0.156	
Adjusted R^2	0.009		-0.033		-0.032	
F value	1.099		0.763		0.829	
N=23						

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Summary

At the jurisdictional level, only changes in median household income were statistically associated with variation in child abuse or neglect rates in all jurisdictions in Virginia and in the 23 localities focused on here. Unlike conventional arguments that median household income is negatively related to rates of child abuse or neglect, here they were positively related. Changes

in unemployment rate and CPS program expenditures were not statistically associated with changes in child abuse or neglect rates either in all jurisdictions in Virginia and in the 23 localities. Changes in foster care rates in all jurisdictions in Virginia were statistically related only to CPS program expenditures, but not to shifts in median household income, unemployment rate, or family assessments. In the 23 jurisdictions, however, no statistically significant influences on changes in foster care rates appeared.

4.3. Individual level

When attention narrows to the 23 jurisdictions whose officials returned surveys, the effects of knowledge sharing and individual and organizational factors on CPS program performance also can be analyzed. As chapter 3 discussed, analyses were conducted in three steps to more fully understand the effects of each of the independent variables on CPS program performance. First, the relationships between explicit and tacit knowledge sharing and CPS program performance were examined, as were the relationships between explicit and tacit knowledge sharing. The second step added individual and organizational factors to the examination of the relationships between knowledge sharing and CPS program performance, identifying the diverse causal relationships. The third step tested the relationships between knowledge sharing and CPS program performance once alternative explanatory variables were added.

4.3.1. Knowledge sharing and program performance

a. Factor analysis of the degree and helpfulness of explicit and tacit knowledge sharing

Before examining the effects of explicit and tacit knowledge sharing on CPS program performance, I tried to reduce multi-collinearity among several of the independent variables. I suspected two items would be strongly related: the degree and helpfulness of knowledge sharing. For example, the more CPS staffers feel that knowledge sharing is helpful in dealing with their workloads, the more they will try to find or share their knowledge. Substantively, the degree and the perceived helpfulness of each kind of knowledge sharing may well be strongly related. The zero-order Pearson correlations confirmed these suspicions: several of these variables were highly correlated with each other. (See table 4-11.)

Table 4-11: Relationships between the Degree and the Helpfulness of Explicit and Tacit Knowledge Sharing

	Degree of Explicit Knowledge Sharing	Helpfulness of Explicit Knowledge Sharing	Degree of Tacit Knowledge Sharing	Helpfulness of Tacit Knowledge Sharing
Degree of Explicit Knowledge Sharing	1.000			
Helpfulness of Explicit Knowledge Sharing	0.684***	1.000		
Degree of Tacit Knowledge Sharing	0.326***	0.372***	1.000	
Helpfulness of Tacit Knowledge Sharing	0.295***	0.368***	0.690***	1.000

Significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests), entries are Pearson's correlations.

Given these correlations among the indicators, I turned to factor analysis (Pedhazur and Schmelkin, 1991).[53] Factor analysis of the four items generated two factors. One includes the degree and helpfulness of explicit knowledge sharing and the other the degree and helpfulness

[53] Scholars argue about appropriate sample size for factor analysis. Comrey and Lee (1992), for example, recommend at least 300 cases for a good factor analysis solution. According to Tabachnick and Fidell (2001), such a solution requires about 150 cases. However, much smaller samples can be used for a factor analysis. Hutcheson and Sofroniou (1999) report a defensible factor analysis solution with only 43 cases. This study also shows a similarly defensible solution with 116 cases.

of tacit knowledge sharing. Based on these findings, I created two composite variables, the usefulness of explicit knowledge sharing and the usefulness of tacit knowledge sharing, by averaging the degree and helpfulness of explicit knowledge sharing and the degree and helpfulness of tacit knowledge sharing, respectively. (See Table 4-12.)

Table 4-12: Degree and Helpfulness of Explicit and Tacit Knowledge Sharing[54]

Items		Component	
		1	2
Helpfulness of Tacit Knowledge Sharing		0.904	0.174
Degree of Tacit Knowledge Sharing		0.894	0.202
Degree of Explicit knowledge Sharing		0.145	0.912
Helpfulness of Explicit Knowledge Sharing		0.237	0.883
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.626	
Bartlett's Test of Sphericity	Approx. Chi-Square	159.555	
	df	6	
	Sig.	.000	

b. Explicit knowledge sharing and changes in child abuse or neglect rates

Using the composite variable, usefulness of explicit knowledge sharing, I then regressed changes in child abuse or neglect rates on three independent variables: the time devoted to, access to, and usefulness of explicit knowledge sharing. (See Table 4-13). It will be recalled that generally CPS staffers reported they could easily access explicit knowledge sharing and believed that sharing explicit knowledge was useful in dealing with their workloads. Regression model 2 was statistically significant, but it explained only about 6.5% of the variation in changes in child

[54] The Kaiser-Meyer-Olkin measure of sampling adequacy suggests that factor analysis is appropriate. The rotated component matrix shows factor loadings.

abuse or neglect rates. Only usefulness of explicit knowledge sharing is a statistically significant predictor in the model.

The reported usefulness of explicit knowledge sharing is negatively related to change in child abuse or neglect rates, supporting hypothesis H2-a. The more CPS staffers shared explicit knowledge and believe that it is useful, the more child abuse or neglect rates decreased. Sharing know-how, information, or knowledge through paper or electronic documents such as CPS procedures and OASIS evidently contributed to decreases in child abuse or neglect rates, even though the magnitude of the decline was fairly small. A one unit increase in the usefulness of explicit knowledge sharing is associated with more than a 0.4% decrease in child abuse or neglect rates. I cannot say, however, that either the time devoted or access to explicit knowledge sharing influenced changes in child abuse or neglect rates. The results do not support H1-a1 and H3-a.

Table 4-13: Explicit Knowledge Sharing and Changes in Child Abuse or Neglect Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	-0.318	0.983	1.627	1.214
Time devoted to Explicit Knowledge Sharing	0.151	0.181	0.206	0.178
Access to Explicit Knowledge Sharing	-0.004	0.145	0.092	0.146
Usefulness of Explicit Knowledge Sharing			-0.444**	0.170
R^2	0.006		0.065*	
Adjusted R^2	-0.012		0.039*	
F value	0.349		2.507	
N=113				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

c. Explicit knowledge sharing and changes in foster care rates

The second dependent variable is changes in foster care rates between 2007 and 2009. Here, regression models with the same three independent variables were not statistically significant, and none of the hypotheses about the relationships between explicit knowledge sharing and changes in foster care rates is supported (H1-a2, H2-a2, and H3-a2). (See Table 4-14.)

Table 4-14: Explicit Knowledge Sharing and Change in Foster Care Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	0.895	1.515	-0.086	1.924
Time devoted to Explicit Knowledge Sharing	-0.151	0.279	-0.179	0.281
Access to Explicit Knowledge Sharing	-0.082	0.224	-0.130	0.232
Usefulness of Explicit Knowledge Sharing			0.224	0.270
R^2	0.004		0.010	
Adjusted R^2	-0.014		-0.017	
F value	0.208		0.368	
N=113				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

d. Tacit knowledge sharing and changes in child abuse or neglect rates

The new variable usefulness of tacit knowledge sharing was used in the next step-wise regression analysis. Again, the regression models were not statistically significant, and none of the hypotheses about tacit knowledge sharing was supported. However, even though tacit knowledge sharing did not affect changes in child abuse or neglect rates directly, it might have indirectly affected them. Substantively, the reported usefulness of tacit knowledge sharing

might be related to finding and sharing explicit knowledge. For example, CPS staffers might find the necessary information or skills through means associated with explicit knowledge sharing (e.g. data bases, procedures manuals) to handle their work through information, know-how, or skills acquired by tacit knowledge sharing, such as informed discussions with colleagues. When CPS staffers communicate or work together, they share tacit knowledge with each other. This shared tacit knowledge can help CPS staffers find where there is necessary explicit knowledge such as relevant regulations or policy related to cases. Therefore, the shared tacit knowledge of CPS staffers might indirectly affect changes in child abuse or neglect rates, a possibility explored later in the chapter.

Table 4-15: Tacit Knowledge Sharing and Changes in Child Abuse or Neglect Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	0.255	1.210	0.298	1.461
Time devoted to Tacit Knowledge Sharing	-0.066	0.198	-0.064	0.202
Access to Tacit Knowledge Sharing	-0.006	0.185	0.002	0.247
Usefulness of Tacit Knowledge Sharing			-0.016	0.299
R^2	0.001		0.001	
Adjusted R^2	-0.017		-0.026	
F value	0.058		0.040	
N=113				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

e. Tacit knowledge sharing and changes in foster care rates

Step-wise regressions examining possible relationships between tacit knowledge sharing and changes in foster care rates were run, producing mixed results. Regression model 1 was

statistically significant, and the time devoted to tacit knowledge sharing was positively related to changes in foster care rates. An increase of one unit in reported time devoted to tacit knowledge sharing was related to more than a 0.5% increase in foster care, supporting H4-a2. However, neither hypotheses H5-a2 nor H6-a2 was supported. In regression model 2 access to tacit knowledge sharing was negatively associated with changes in foster care rates.[55] It might be possible that CPS staffers who access colleagues' experiences and skills might resolve problems without placing children in foster care.

Table 4-16: Tacit Knowledge Sharing and Change in Foster Care Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	1.383	1.826	0.118	2.193
Time devoted to Tacit Knowledge Sharing	0.516*	0.299	0.460	0.304
Access to Tacit Knowledge Sharing	-0.464	0.280	-0.718*	0.371
Usefulness of Tacit Knowledge Sharing			0.467	0.449
R^2	0.44*		0.54	
Adjusted R^2	0.27*		0.28	
F value	2.541		2.056	
N=113				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

f. Explicit and tacit knowledge sharing and changes in child abuse or neglect rates

To examine the effects of both explicit and tacit knowledge sharing on changes in child abuse or neglect rates, I again returned to step-wise regression analysis. (See Table 4-17.) The

[55] Even though access to tacit knowledge sharing was a statistically significant predictor affecting changes in foster care rates in regression model 2, I do not interpret this relationship, because the full model was not statistically significant.

first and second regression models are statistically significant, explaining about 5.6% and 7.8% of the variation in child abuse or neglect rates, respectively. However, the third is not statistically significant.

Based on these results, I consider regression model 2 to be an appropriate model to identify the relationships between explicit and tacit knowledge sharing and changes in child abuse or neglect rates. Among the four independent variables, only usefulness of explicit knowledge sharing is a statistically significant predictor. A higher reported usefulness of explicit knowledge sharing is associated with decreases in child abuse or neglect rates between 2007 and 2009; an increase of one unit in reported usefulness of explicit knowledge sharing produces over a 0.5% decrease in child abuse or neglect rates. Moreover, usefulness of explicit knowledge sharing performs consistently across the three models.

Table 4-17: Predicting changes in child abuse or neglect rates

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	coefficients	S.E.	coefficients	S.E.
(Constant)	1.464	1.451	0.924	1.544	0.863	1.596
Usefulness of Explicit Knowledge sharing	-0.458**	0.18	-0.516***	0.183	-0.519***	0.186
Usefulness of Tacit Knowledge sharing	0.201	0.234	0.315	0.247	0.288	0.312
Time devoted to Explicit Knowledge Sharing			0.284	0.19	0.283	0.192
Time devoted to Tacit Knowledge Sharing			-0.175	0.205	-0.171	0.21
Access to Explicit Knowledge Sharing					0.022	0.17
Access to Tacit Knowledge Sharing					0.018	0.26
R^2	0.056**		0.078*		0.078	
Adjusted R^2	0.039**		0.043*		0.025	
F value	3.256		2.251		1.478	

N=112			

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

g. Explicit and tacit knowledge sharing and changes in foster care rates

To examine the effects of explicit and tacit knowledge sharing on changes in foster care rates, I again relied on step-wise regression analysis. (See Table 4-18.) None of the regression models is statistically significant. Even though the coefficients between time devoted and access to tacit knowledge sharing and changes in foster care rates in regression model 3 are statistically significant, they cannot be used as predictors with any confidence because the overall model is not statistically significant. Further, the other independent variables are not statistically significant predictors of changes in foster care rates.

Table 4-18: Predicting Changes in Foster Care Rates

	model 1		model 2		model 3	
Independent variables	coefficients	S.E.	Coefficients	S.E.	coefficients	S.E.
(Constant)	-0.629	2.296	-0.523	2.431	-0.005	2.466
Usefulness of Explicit Knowledge sharing	0.189	0.285	0.282	0.289	0.299	0.287
Usefulness of Tacit Knowledge sharing	-0.069	0.370	-0.306	0.389	0.234	0.482
Time devoted to Explicit Knowledge Sharing			-0.335	0.298	-0.342	0.296
Time devoted to Tacit Knowledge Sharing			0.567*	0.323	0.584*	0.324
Access to Explicit Knowledge Sharing					0.131	0.262
Access to Tacit Knowledge Sharing					-0.798**	0.401
R^2	0.004		0.036		0.071	
Adjusted R^2	-0.014		0.000		0.018	
F value	0.224		0.996		1.345	
N=112						

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

h. Effects on usefulness of explicit knowledge sharing

Next attention turned to the possible relationships among the knowledge sharing variables. The results of regression analyses of the effects of explicit and tacit knowledge sharing on changes in child abuse or neglect rates showed that only usefulness of explicit knowledge sharing had a statistically significant influence on changes in child abuse or neglect rates. However, as mentioned above, the relationships between usefulness of explicit knowledge sharing and other knowledge sharing variables need to be examined, because it seems possible that relationships exist between the usefulness of explicit and tacit knowledge sharing. It is also possible that the time devoted and access to explicit knowledge sharing are related to the usefulness of explicit knowledge sharing. For example, as CPS staffers have more time for and access to explicit knowledge sharing, they could find that such knowledge sharing was more useful. In addition, when checking the correlations between the time devoted to, access to, and usefulness of explicit knowledge sharing and the usefulness of tacit knowledge sharing, I found that some variables were significantly related to usefulness of explicit knowledge sharing. (See Table 4-19.) For these reasons, I regressed the usefulness of explicit knowledge sharing on three independent variables, time devoted and access to explicit knowledge sharing and usefulness of tacit knowledge sharing. (See Table 4-19.)

Table 4-19: Usefulness of Explicit and Tacit Knowledge Sharing, Time Devoted to and Access to Explicit Knowledge Sharing

	Usefulness of Tacit Knowledge Sharing	Time devoted to Explicit Knowledge Sharing	Access to Explicit Knowledge Sharing
Usefulness of Explicit Knowledge Sharing	.405***	.125*	.262***

Significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests), entries are Pearson's correlations.

The regression model is statistically significant and explains nearly 21% of the variance in reported usefulness of explicit knowledge sharing. Usefulness of tacit knowledge sharing and time devoted to explicit knowledge sharing are statistically significant predictors, but access to explicit knowledge sharing is not. The more CPS staffers spent time sharing explicit knowledge and found tacit knowledge sharing to be useful, the more they reported explicit knowledge sharing to be useful, supporting hypotheses H1-b and H5-b.

Table 4-20: Usefulness of Explicit Knowledge Sharing

	model	
Independent variables	coefficients	S.E.
(Constant)	1.813	0.771
Usefulness of Tacit Knowledge Sharing	0.487***	0.119
Time devoted to Explicit Knowledge Sharing	0.191**	0.093
Access to Explicit Knowledge Sharing	0.098	0.081
R^2	0.206***	
Adjusted R^2	0.184***	
F value	9.587	
N=115		

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

i. Effects on usefulness of tacit knowledge sharing

To more fully understand the effects of knowledge sharing on CPS program performance, these relationships between the usefulness of tacit knowledge sharing and the time devoted and access to tacit knowledge sharing and the usefulness of explicit knowledge sharing also need to be examined. CPS staffers' perceptions of the usefulness of tacit knowledge sharing are likely to be related to their perceptions of the usefulness of explicit knowledge sharing and the time devoted and access to tacit knowledge sharing. Pearson

correlations also show that they are significantly associated with each other. (See Table 4-21.) I regressed the usefulness of tacit knowledge sharing on time devoted and access to tacit knowledge sharing and the usefulness of explicit knowledge sharing.

Table 4-21: Usefulness of Explicit and Tacit Knowledge Sharing, Time Devoted to and Access to Tacit Knowledge Sharing

	Time devoted to Tacit Knowledge Sharing	Access to Tacit Knowledge Sharing	Usefulness of Explicit Knowledge Sharing
Usefulness of Tacit Knowledge Sharing	.231***	.677***	.405***

Significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests), entries are Pearson's correlations.

The regression model is statistically significant, and the three independent variables accounted for almost 52% of the variation in reported usefulness of tacit knowledge sharing. All of the independent variables are statistically significant predictors. The more CPS staffers spent time sharing tacit knowledge, the more easily they could access that knowledge; the more they found explicit knowledge sharing to be useful, the more they found tacit knowledge sharing useful. Especially important appears to be reported access to tacit knowledge sharing. These results support hypotheses H4-b, H6-b, and H2-b.

Table 4-22: Usefulness of Tacit Knowledge Sharing

	model	
Independent variables	Coefficients	S.E.
(Constant)	1.937	.423
Time devoted to Tacit Knowledge Sharing	.128**	.062
Access to Tacit Knowledge Sharing	.504***	.060
Usefulness of Explicit Knowledge Sharing	.166***	.054
R^2	0.518***	
Adjusted R^2	0.505***	
F value	39.694	

N=115	

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Summary: step 1

The results of regression analyses of explicit/tacit knowledge sharing and changes in child abuse or neglect rates and in foster care rates in step 1 led to various conclusions about the hypotheses presented in the chapter 3. Seven of the 18 knowledge sharing hypotheses were supported. (See Table 4-23.)

Table 4-23: Summary of Findings (step 1)

Hypothesis	Path			Results of hypothesis test
H1-a1	Time devoted to Explicit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Reject
H1-a2	Time devoted to Explicit Knowledge Sharing	--->	Changes in Foster Care Rate	Reject
H1-b	Time devoted to Explicit Knowledge Sharing	--->	Usefulness of Explicit Knowledge Sharing	Support
H2-a1	Usefulness of Explicit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Support
H2-a2	Usefulness of Explicit Knowledge Sharing	--->	Changes in Foster Care Rate	Reject
H2-b	Usefulness of Explicit Knowledge Sharing	--->	Usefulness of Tacit Knowledge Sharing	Support
H3-a1	Access to Explicit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Reject
H3-a2	Access to Explicit Knowledge Sharing	--->	Changes in Foster Care Rate	Reject
H3-b	Access to Explicit Knowledge Sharing	--->	Usefulness of Explicit Knowledge Sharing	Reject
H4-a1	Time devoted to Tacit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Reject
H4-a2	Time devoted to Tacit Knowledge Sharing	--->	Changes in Foster Care Rate	Support
H4-b	Time devoted to Tacit Knowledge Sharing	--->	Usefulness of Tacit Knowledge Sharing	Support

H5-a1	Usefulness of Tacit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Reject
H5-a2	Usefulness of Tacit Knowledge Sharing	--->	Changes in Foster Care Rate	Reject
H5-b	Usefulness of Tacit Knowledge Sharing	--->	Usefulness of Explicit Knowledge Sharing	Support
H6-a1	Access to Tacit Knowledge Sharing	--->	Changes in Child Abuse or Neglect Rate	Reject
H6-a2	Access to Tacit Knowledge Sharing	--->	Changes in Foster Care Rate	Reject
H6-b	Access to Tacit Knowledge Sharing	--->	Usefulness of Tacit Knowledge Sharing	Support

Only the reported usefulness of explicit knowledge sharing was statistically associated with the variation of child abuse or neglect rates. Increases in reported usefulness of explicit knowledge sharing had a direct effect on decreases in child abuse or neglect rates. At the same time, time devoted to explicit knowledge sharing and the usefulness of tacit knowledge sharing were statistically related to the usefulness of explicit knowledge sharing. Even though time devoted to explicit knowledge sharing and the usefulness of tacit knowledge sharing did not affect the variation of child abuse or neglect rates directly, they could affect changes in child abuse or neglect rates through the usefulness of explicit knowledge sharing. In addition, time devoted and access to tacit knowledge sharing were statistically related to the usefulness of tacit knowledge sharing. They apparently had an indirect effect on changes in child abuse or neglect rates through the usefulness of explicit knowledge sharing.

Step 2 of the analysis examines the effects of individual and organizational factors on the relationship between knowledge sharing and CPS program performance.

4.3.2. Knowledge sharing, individual/organizational factors and CPS program performance

As the conceptual framework suggests, public service motivation and self-set goals of CPS workers (individual factors) and the extent and nature of red tape (an organizational factor) may affect knowledge sharing and CPS program performance. Step 2 of the analysis examines the effects of public service motivation, self-set goals and red tape on explicit and tacit knowledge sharing and on changes in child abuse or neglect rates and in foster care rates.

a. Factor analysis of individual and organizational factors

The survey items tapping potential individual and organizational influences were examined using factor analysis to see whether and how the responses clustered. The factor analysis included 11 independent variables on public service motivation, self-set goals and red tape. The Pearson correlation matrix in Table 4-24 shows that the public service motivation items are inter-correlated and correlated with the self-set goal items. The self-set goal items also show high inter-correlations, and the red tape items are correlated each other.

Table 4-24: Relationships among Public Service Motivation, Self-set Goals and Red tape

	PSM1	PSM2	PSM3	SG1	SG2	SG3	RT1	RT2	RT3	RT4	RT5
PSM1	1										
PSM2	.333***	1									
PSM3	.387***	.304***	1								
SG1	.540***	.205**	.187**	1							
SG2	.571***	.346***	.459***	.370***	1						
SG3	.561***	.334***	.387***	.494***	.605***	1					
RT1	-.038	-.010	.036	.116	.012	-.108	1				
RT2	-.030	.092	-.022	-.144	-.074	-.170*	.633***	1			
RT3	.014	.027	.072	.036	-.024	-.032	.451***	.488***	1		
RT4	-.060	-.002	-.126	-.065	-.080	-.211**	.417***	.496***	.395***	1	

RT5	-.006	.049	-.101	.009	-.114	-.181*	.429***	.546***	.532***	.612***	1

PSM1: Motivation for public service job, PSM2: Motivation for public good, PSM3: Motivation for public service, SG1: Self-set goal about work, SG2: Hardness of self-set goal achievement, SG3: Clearness of self-set goal, RT1: Red tape within organizations, RT2: Red tape with outside organizations, RT3: Red tape in budgeting, RT4: Red tape of reporting documents, RT5: Red tape about new ideas

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Factor analysis of these survey responses generated two factors. (See Table 4-25.) The first includes the five red tape items and the second the six individual items (three on public service motivation and three on self-set goals). The new composite variables are named "red tape" and "personal motivation" and included in further analysis.

Table 4-25: Red tape, Self-set Goal, and Public Service Motivation

Items		Component	
		1	2
Red tape with Outside Organizations		0.825	-0.043
Red tape about New ideas		0.803	-0.075
Red tape within Organizations		0.751	0.055
Red tape of Reporting Documents		0.745	-0.143
Red tape about Budgeting		0.730	0.077
Clearness of Self-set Goal		-0.182	0.800
Motivation for Public Service Job		-0.016	0.788
Hardness of Self-set Goal Achievement		-0.052	0.787
Self-set Goal about Work		-0.007	0.634
Motivation for Public Service		-0.012	0.616
Motivation for Public Good		0.074	0.491
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			0.747
Bartlett's Test of Sphericity	Approx. Chi-Square		416.975
	df		55
	Sig.		.000

b. Personal motivation, red tape, and changes in child abuse or neglect rates

I examined the relationships between personal motivation, red tape, and changes in child abuse or neglect rates. Descriptively, CPS staffers reported high levels of personal motivation and perceived that their organizations had some red tape. (See Table 4-26.)

Table 4-26: Personal Motivation and Red Tape: Descriptive Statistics

	Mean	Std. Deviation
Personal Motivation	6.25	0.59
Red tape	4.36	1.31

Regressions including these variables yielded differing results. (See table 4-27.) Regression model 1 is not statistically significant, but regression model 2 including personal motivation and red tape as well as the time and usefulness of explicit and tacit knowledge sharing is statistically significant at the 90% confidence level. Yet, the second model explained only 9.3% of the variation in child abuse or neglect rates. The coefficients for personal motivation and red tape are insignificant in both models, but reported usefulness of explicit knowledge sharing retained statistical significance with the addition of individual and organizational variables as controls. Based on these results, neither H7-a1 nor H8-a1 is supported.

Table 4-27: Predicting Changes in Child Abuse or Neglect Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	-2.636	2.052	-0.824	2.408
Personal Motivation	0.371	0.305	0.372	0.316
Red tape	0.077	0.138	-0.032	0.142
Time devoted to Explicit Knowledge Sharing			0.304	0.188

Time devoted to Tacit Knowledge Sharing			-0.223	0.208
Usefulness of Tacit Knowledge Sharing			0.256	0.252
Usefulness of Explicit Knowledge Sharing			-0.511***	0.186
R^2	0.015		0.093*	
Adjusted R^2	-0.003		0.042*	
F value	0.850		1.818	
N=114				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

c. Personal motivation, red tape, and changes in foster care rates

When reports of personal motivation and red tape are analyzed as possible influences on changes in foster care rates, neither of the models is statistically significant, and hypotheses H7-a2 and H8-a2 are rejected. (See Table 4-28.)

Table 4-28: Predicting Changes in Foster Care Rates

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	0.125	3.183	-0.498	3.821
Personal Motivation	0.079	0.474	0.010	0.502
Red tape	-0.133	0.214	-0.014	0.225
Time devoted to Explicit Knowledge Sharing			-0.339	0.299
Time devoted to Tacit Knowledge Sharing			0.579*	0.330
Usefulness of Tacit Knowledge Sharing			-0.329	0.399
Usefulness of Explicit Knowledge Sharing			0.295	0.296
R^2	0.004		0.039	
Adjusted R^2	-0.014		-0.015	
F value	0.215		0.729	
N=114				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

d. Personal motivation, red tape, and explicit and tacit knowledge sharing

Several of the Pearson's correlations for the relationships among personal motivation, red tape, and explicit and tacit knowledge sharing were statistically significant. (See Table 4-29.) Even though personal motivation and red tape evidently do not affect changes in child abuse or neglect or foster care rates directly, it is possible that the two may indirectly affect CPS performance through explicit or tacit knowledge sharing.

Table 4-29: Personal Motivation, Red Tape, and Explicit and Tacit Knowledge Sharing

	Personal Motivation	Red tape
Personal Motivation	1.000	
Red tape	-0.064	1.000
Time devoted to Explicit Knowledge Sharing	-0.057	-0.032
Usefulness of Explicit Knowledge Sharing	0.081	-0.198**
Access to Explicit Knowledge Sharing	0.088	-0.109
Time devoted to Tacit Knowledge Sharing	0.190**	-0.193**
Usefulness of Tacit Knowledge Sharing	0.326***	0.001
Access to Tacit Knowledge Sharing	0.150	-0.152

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests). Entries are Pearson's Correlations.

A regression model that tested the effects of personal motivation and red tape on time devoted to tacit knowledge sharing was statistically significant ($p<0.05$), explaining 6.9% of the variance in time devoted to tacit knowledge sharing. (See Table 4-30.) Both relationships were in the expected directions: personal motivation was positively related to time devoted to tacit knowledge sharing, while the relationship between red tape and time devoted to tacit knowledge sharing was negative.

Table 4-30: Predicting Time Devoted to Tacit Knowledge Sharing

	model	
Independent variables	coefficients	S.E.
(Constant)	1.796	0.905
Personal Motivation	0.264*	0.134
Red tape	-0.130**	0.065
R^2	0.069**	
Adjusted R^2	0.052**	
F value	4.178	
N=116		

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Similarly, a regression model examining the impact of personal motivation and red tape on the reported usefulness of tacit knowledge sharing was statistically significant and explained about 10.7% of the variation in the dependent variable. (See Table 4-31.) This time, only personal motivation was a statistically significant (and positive) influence on the reported usefulness of tacit knowledge sharing.

Table 4-31: Predicting Usefulness of Tacit Knowledge Sharing

	model	
Independent variables	coefficients	S.E.
(Constant)	3.481	0.820
Personal Motivation	0.448***	0.122
Red tape	0.015	0.059
R^2	0.107***	
Adjusted R^2	0.091***	
F value	6.770	
N=116		

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

When attention turns to examining the effects of personal motivation and red tape on the usefulness of explicit knowledge sharing, the overall regression model is statistically significant ($p<0.10$), and it explains 4.4% of the variation in the usefulness of explicit knowledge sharing. Although red tape was statistically significant in the model, personal motivation was not. Increases in red tape are related to decreases in the reported usefulness of explicit knowledge sharing; a one unit increase in reported red tape produces a small 0.16 unit decrease in the usefulness of explicit knowledge sharing. (See Table 4-32.)

Table 4-32: Predicting Usefulness of Explicit Knowledge Sharing

	model	
Independent variables	coefficients	S.E.
(Constant)	5.878	1.083
Personal Motivation	0.120	0.161
Red tape	-0.163**	0.078
R^2	0.044*	
Adjusted R^2	0.027*	
F value	2.584	
N=116		

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

These results suggest that even though personal motivation and red tape did not appear to be directly related to changes either in child abuse or neglect rates or in foster care rates, they might affect CPS program performance through the reported time devoted to tacit knowledge sharing and the usefulness of tacit and explicit knowledge sharing. For example, the usefulness of explicit knowledge sharing was negatively associated with red tape. That means that the more CPS staffers perceived red tape in doing their jobs, the less they were likely to report that they shared explicit knowledge or believed explicit knowledge sharing to be useful.

As increases in the reported usefulness of explicit knowledge sharing was significantly related to decreases in child abuse or neglect rates, red tape might be indirectly related to increases in child abuse or neglect rates. (These effects will be examined by path analysis later in the chapter.) In addition, although personal motivation affected only variation in tacit knowledge sharing, red tape had negative effects on both tacit and explicit knowledge sharing. Time devoted to tacit knowledge sharing was affected by both personal motivation and red tape.

Summary: step 2

The step 2 analyses examined several of the hypotheses set forth in chapter 3. This time, only one quarter of the hypotheses (4 of 16) was supported. (See Table 4-33.)

Table 4-33: Summary of Findings (step 2)

H	Path			Results of hypothesis test
H7-a1	Personal Motivation	--->	Changes in Child Abuse or Neglect Rate	Reject
H7-a2	Personal Motivation	--->	Changes in Foster Care Rate	Reject
H7-b1	Personal Motivation	--->	Time devoted to Explicit Knowledge Sharing	Reject
H7-b2	Personal Motivation	--->	Usefulness of Explicit Knowledge Sharing	Reject
H7-b3	Personal Motivation	--->	Access to Explicit Knowledge Sharing	Reject
H7-c1	Personal Motivation	--->	Time devoted to Tacit Knowledge Sharing	Support
H7-c2	Personal Motivation	--->	Usefulness of Tacit Knowledge Sharing	Support
H7-c3	Personal Motivation	--->	Access to Tacit Knowledge Sharing	Reject
H8-a1	Red tape	--->	Changes in Child Abuse or Neglect Rate	Reject
H8-a2	Red tape	--->	Changes in Foster Care Rate	Reject
H8-b1	Red tape	--->	Time devoted to Explicit Knowledge Sharing	Reject
H8-b2	Red tape	--->	Usefulness of Explicit Knowledge Sharing	Support

H8-b3	Red tape	--->	Access to Explicit Knowledge Sharing	Reject
H8-c1	Red tape	--->	Time devoted to Tacit Knowledge Sharing	Support
H8-c2	Red tape	--->	Usefulness of Tacit Knowledge Sharing	Reject
H8-c3	Red tape	--->	Access to Tacit Knowledge Sharing	Reject

Although personal motivation and red tape were not directly related to variation in child abuse or neglect rates or in foster care rates, personal motivation was statistically associated with time devoted to tacit knowledge sharing and the usefulness of tacit knowledge sharing, and red tape was statistically related to time devoted to tacit knowledge sharing and the usefulness of explicit knowledge sharing. The results indicated that even though personal motivation and red tape did not have direct effects on CPS program performance, they might affect changes in child abuse or neglect rates or in foster care rates indirectly through explicit and tacit knowledge sharing.

The next section compares the effects on CPS program performance of explicit and tacit knowledge sharing to those of several alternative explanatory factors. Doing so will help further isolate the possible impact of explicit and tacit knowledge sharing on CPS program performance, controlling for the effects of other factors.

4.3.3. Full model

The model in step 3 examines the effects on CPS program performance of economic conditions, staffers' professionalism, financial resources, personal motivation, and red tape as well as of explicit and tacit knowledge sharing. Examined first is the primary outcome variable—

changes in child abuse or neglect rates between 2007 and 2009. Then the focal output variable—changes in foster care rates—receives attention.

a. Changes in child abuse or neglect rates

To fully understand the effects of explicit and tacit knowledge sharing on CPS program performance with other possible explanatory factors, I again used step-wise regression analysis. I compared the first model including the control variables (economic conditions, staffers' professionalism, financial resources, personal motivation, and red tape) with a second model that added explicit and tacit knowledge sharing. By comparing the two, I examined the effects of explicit and tacit knowledge sharing on changes in child abuse or neglect rates, holding more conventional influences constant.

Both regression models were statistically significant (see Table 4-34), explaining 19.8% and 26.5% of the variation in changes in child abuse or neglect rates ($p<0.01$). The evident improvement in the second model suggests that the addition of explicit and tacit knowledge sharing is meaningful.

The results in the full model point to several interesting things. First, changes in median household income were positively related with changes in child abuse or neglect rates. An increase of $1,000 in median household income is associated with about a 0.3% increase in child abuse or neglect rates. This is counter to the expectation that median household income would be negatively related to child abuse or neglect rates. Changes in unemployment rates also were significantly related to changes in child abuse or neglect rates. An increase of 1% in the local unemployment rate was associated with almost a 0.6% increase in child abuse or

neglect rates. In addition, personal motivation was positively related to changes in child abuse or neglect rates. An increase of one unit in personal motivation was associated with about a 0.7% increase in child abuse or neglect rates. That is, personal motivation had a negative effect on CPS program performance.

Second, when comparing the two models, including explicit and tacit knowledge sharing improved the ability to explain about 6.7% more of the variation in changes in child abuse or neglect rates. In addition, even when controlling for economic conditions, CPS program expenditures, staffers' professionalism, personal motivation, and red tape, the time devoted to and the usefulness of explicit knowledge sharing were statistically associated with changes in child abuse or neglect rates. For example, an increase of one unit in the reported usefulness of explicit knowledge sharing produced at least a 0.4% decrease in child abuse or neglect rates. Meanwhile, additional time devoted to tacit knowledge sharing was related to an increase in child abuse or neglect rates.

These findings do not support H9-a1, H10-a1, H10-b1, H10-c1, H10-d1, and H11a, but are consistent with H9-b1.

Table 4-34: Predicting Changes in Child Abuse or Neglect Rates: Full Model

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	-4.212	2.211	-2.593	2.650
Change in Median Household Income ($100s) (2008-2007)	0.031***	0.009	0.033***	0.009
Change in Unemployment Rate (2008-2007)	0.421	0.340	0.597*	0.347
Change in CPS Program Expenditures ($1000s) (2008-2007)	-0.001**	0.000	-0.001	0.000

Degree of Education (dummy)	0.456	0.378	0.325	0.379
Tenure as a CPS Staffer	-0.193	0.147	-0.162	0.149
Frequency of CPS Work Training	-0.125	0.148	-0.177	0.152
Change in Family Assessments (2008-2007)	0.000	0.003	0.001	0.003
Personal Motivation	0.652**	0.325	0.687**	0.342
Red Tape	0.095	0.142	0.007	0.151
Time devoted to Explicit Knowledge Sharing			0.357*	0.191
Time devoted to Tacit Knowledge Sharing			-0.215	0.210
Usefulness of Explicit Knowledge Sharing			-0.406**	0.189
Usefulness of Tacit Knowledge Sharing			0.109	0.327
Access to Explicit Knowledge Sharing			-0.123	0.166
Access to Tacit Knowledge Sharing			0.086	0.263
R^2	0.198***		0.265***	
Adjusted R^2	0.126***		0.147***	
F value	2.738		2.256	
N=110				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

b. Changes in foster care rates

To examine the effects of economic conditions, staffers' professionalism, financial resources, personal motivation, red tape, and explicit and tacit knowledge sharing on changes in foster care rates, I turned to step-wise regression analysis. Both regression models 1 and 2 were statistically significant (p<0.01). (See Table 4-35.) Regression model 1, including all but the knowledge sharing variables, explained almost 25.9% the variation in change in foster care rates. When the knowledge sharing variables were added, model 2 explained about 29.9% of the variation.

In the second model, changes in CPS program expenditure and in family assessments, education, and time devoted to tacit knowledge sharing were each statistically related to changes in foster care rates. Supporting H11b, increases in CPS program expenditures were related to increases in abused or neglected children in foster care, even though the strength of the relationship was relatively weak. Respondent education was a statistically significant influence on changes in foster care rates, supporting H10-a2. CPS staffers with masters' degrees or above, compared with other workers, were associated with over a 1% decrease in foster care rates. Changes in family assessments also were significantly and positively related to changes in foster care rates, supporting H10-d2.[56] In addition, the results showed that time devoted to tacit knowledge sharing was significantly related to changes in foster care rates. The more time CPS staffers spent sharing tacit knowledge, the more often abused or neglected children were placed in foster care. However, the effects of economic conditions on changes in foster care rates were not statistically significant, rejecting H9-a2 and H9-b2. The frequency of CPS work training and work experience also were not significantly related to changes in foster care rates; neither H10-c2 nor H10-b2 is supported.

Table 4-35: Predicting Changes in Foster Care Rates: Full Model

	model 1		model 2	
Independent variables	coefficients	S.E.	coefficients	S.E.
(Constant)	1.196	3.275	2.264	3.987
Change in Median Household Income ($100s) (2008-2007)	-0.018	0.014	-0.017	0.014
Change in Unemployment Rate (2008-2007)	0.508	0.504	0.519	0.523

[56] This may be because an increase in the numbers of family assessments may mean an increase in findings of abuse or neglect, which could increase the numbers of children placed in foster care.

Change in CPS Program Expenditures ($1000s) (2008-2007)	0.002***	0.001	0.002***	0.001
Degree of Education (dummy)	-1.261**	0.559	-1.325**	0.570
Tenure as a CPS Staffer	0.359	0.218	0.259	0.224
Frequency of CPS Work Training	-0.195	0.219	-0.102	0.228
Change in Family Assessments (2008-2007)	0.024***	0.005	0.023***	0.005
Personal Motivation	-0.555	0.482	-0.676	0.514
Red Tape	-0.053	0.210	-0.022	0.227
Time devoted to Explicit Knowledge Sharing			-0.216	0.287
Time devoted to Tacit Knowledge Sharing			0.602*	0.316
Usefulness of Explicit Knowledge Sharing			0.140	0.285
Usefulness of Tacit Knowledge Sharing			-0.074	0.492
Access to Explicit Knowledge Sharing			0.156	0.250
Access to Tacit Knowledge Sharing			-0.490	0.396
R^2	O.259***		0.299***	
Adjusted R^2	0.192***		0.188***	
F value	3.883		2.679	
N=110				

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Summary: step 3

The results of the hypotheses tested in step 3 are summarized in table 4-36. Four out of the 14 hypotheses were supported.

Table 4-36: Summary of hypotheses findings (step 3)

H	Path			Results of hypothesis test
H9-a1	Changes in Median	--->	Changes in Child Abuse or	Reject

	Household Income		Neglect Rate	
H9-a2	Changes in Median Household Income	--->	Changes in Foster Care Rate	Reject
H9-b1	Changes in Unemployment Rate	--->	Changes in Child Abuse or Neglect Rate	Support
H9-b2	Changes in Unemployment Rate	--->	Changes in Foster Care Rate	Reject
H10-a1	Degree of Education	--->	Changes in Child Abuse or Neglect Rate	Reject
H10-a2	Degree of Education	--->	Changes in Foster Care Rate	Support
H10-b1	Tenure as a CPS Staffer	--->	Changes in Child Abuse or Neglect Rate	Reject
H10-b2	Tenure as a CPS Staffer	--->	Changes in Foster Care Rate	Reject
H10-c1	Frequency of CPS Work Training	--->	Changes in Child Abuse or Neglect Rate	Reject
H10-c2	Frequency of CPS Work Training	--->	Changes in Foster Care Rate	Reject
H10-d1	Changes in Family Assessments	--->	Changes in Child Abuse or Neglect Rate	Reject
H10-d2	Changes in Family Assessments	--->	Changes in Foster Care Rate	Support
H11a	Changes in CPS Program Expenditures	--->	Changes in Child Abuse or Neglect Rate	Reject
H11b	Changes in CPS Program Expenditures	--->	Changes in Foster Care Rate	Support

Even when controlling for alternative explanatory factors affecting CPS program performance, the time devoted to and the reported usefulness of explicit knowledge sharing were statistically associated with changes in child abuse or neglect rates. Although the time devoted to explicit knowledge sharing was positively related to changes in child abuse or neglect rates, the usefulness of explicit knowledge sharing was negatively related to changes in child abuse or neglect rates. Only usefulness of explicit knowledge sharing had a positive effect on CPS program performance. The negative effects on performance of changes in median

household income, unemployment rates, and personal motivation highlight the importance of usefulness of explicit knowledge sharing in improving CPS program performance.

The next section uses path analysis to examine direct and indirect effects in the various relationships among variables. It helps to further understanding of the roles and effects of knowledge sharing on CPS program performance by identifying the direct and indirect effects of knowledge sharing, personal motivation, red tape, and alternative explanatory factors on CPS program performance.

4.4. Path analysis

The results of the regression analyses discussed in the previous sections showed only direct relationships between CPS program performance and the variables explicit and tacit knowledge sharing, personal motivation, red tape, and alternative explanatory factors. Path analysis can show the relationships among these variables more clearly, including both direct and indirect effects.[57] Since this study identified complex relationships among variables through the addition of intervening factors, I used path analysis to examine the patterns of causation among variables.

The path diagrams (see Figures 4-1 and 4-2) show the complex relationships among variables included in the regression analyses.[58] Figure 4-1 portrays the relationships among

[57] Anderson and Gerbing (1988) suggest evaluating discriminant validity by using Chi-square difference tests comparing pairs of estimated constructs in constrained and unconstrained models. All values of the estimated Chi-square difference are over 9.21 at an alpha value of 0.01, the critical value of the Chi-square difference test, indicating that the constructs are not perfectly correlated. The results of discriminant validity tests are summarized in Appendix G.

[58] Several overall goodness of fit indices indicate how well the specified models account for the data (Anderson and Gerbing, 1988). The indices for the model in Figure 4-1 are comparative fit index (CFI) 0.79 and adjusted

knowledge sharing, personal motivation, red tape, and CPS program performance, while the expanded model including all variables appears in figure 4-2.[59]

4.4.1. Knowledge sharing, personal motivation and red tape, and CPS program performance

Figure 4-1 shows the causal relationships among explicit and tacit knowledge sharing, personal motivation, red tape, and changes in child abuse or neglect rates and in foster care rates. (See Table 4-37.) First, the usefulness of explicit knowledge sharing reported by CPS staffers and changes in foster care rates are statistically associated with the variation in changes in child abuse or neglect rates. Increases in the usefulness of explicit knowledge sharing are directly related to decreases in child abuse or neglect rates. An increase of one standard deviation in the usefulness of explicit knowledge sharing is associated with almost a 0.3 standard deviation decrease in child abuse or neglect rates. In addition, changes in foster care rates are negatively associated with changes in child abuse or neglect rates. The more children were in foster care, the fewer abused or neglected children there were. An increase of one

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goodness of fit index (AGFI) 0.76; corresponding indices for the full model in Figure 4-2 are CFI 0.57 and AGFI 0.70. CFI and AGFI values that are close to 1 indicate a very good fit (Bartholomew, et al., 2008). Neither model performs very well. However, they do better when attention turns to absolute fit measures: on the Goodness of Fit Index (GFI), the models score more acceptable 0.91 and 0.80. See Appendix H.

[59] I excluded alternative explanatory variables in Figure 4-1 for two reasons. First, the primary purpose of the path analysis was to examine intervening variables. As the relationship between alternative explanatory variables and CPS program performance is hypothesized to be direct, it is reasonable to exclude these variables from the first path analysis. Second, because the coefficient of each relationship in path analysis is sensitive to the model's specification, the designation of paths and the addition of variables to a model can affect the coefficients. Therefore, casual relationships among knowledge sharing, personal motivation, red tape, and CPS program performance can be seen more clearly by first reducing the number of variables. The full model appears in Figure 4-2.

standard deviation in changes in foster care rates is related to more than a 0.6 standard deviation decrease in child abuse or neglect rates.

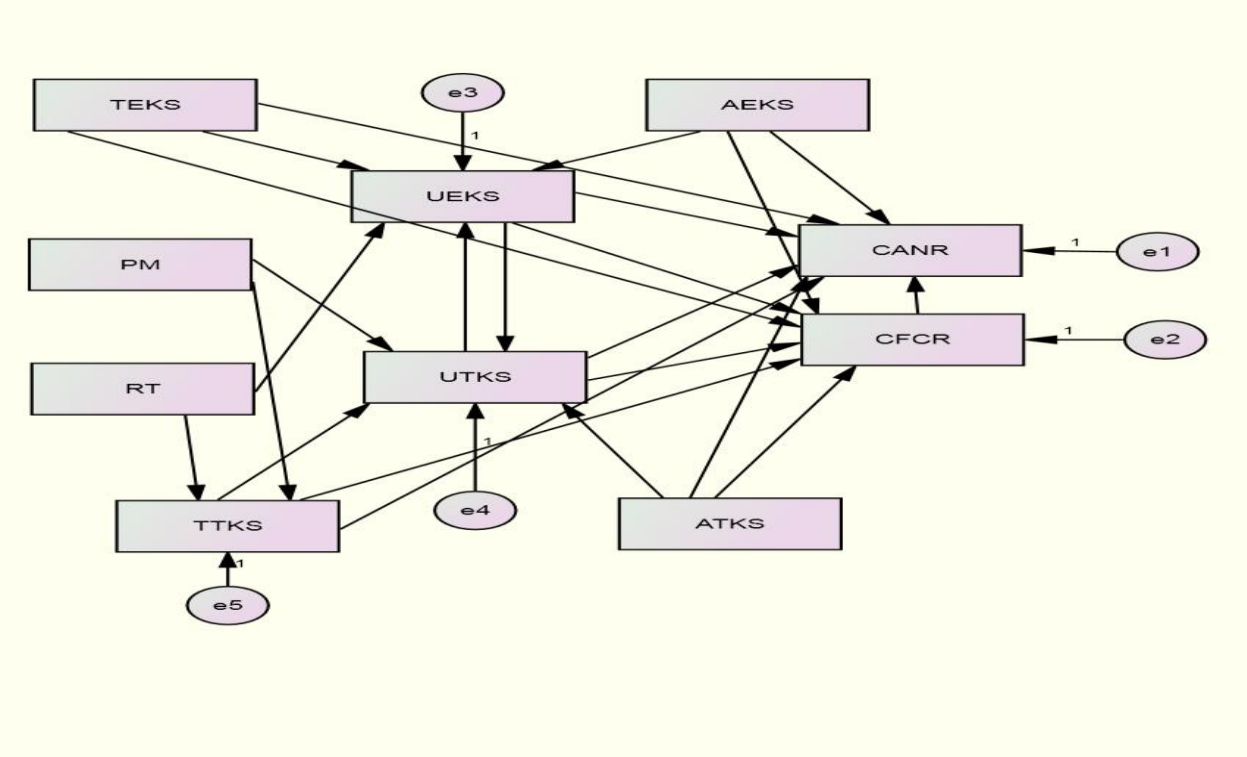
Second, the usefulness of tacit knowledge sharing, red tape, and the time devoted to explicit knowledge sharing are significantly related to the reported usefulness of explicit knowledge sharing. Increases in time devoted to explicit knowledge sharing and in the usefulness of tacit knowledge sharing are related to increases in the usefulness of explicit knowledge sharing. In contrast, an increase in red tape is related to a decrease in the usefulness of explicit knowledge sharing. When comparing the standardized path coefficients among time devoted to explicit knowledge sharing (β=.17), the usefulness of tacit knowledge sharing (β=.39), and red tape (β=-.19), the usefulness of tacit knowledge sharing had the strongest effect on the usefulness of explicit knowledge sharing.

Third, personal motivation and access to tacit knowledge sharing had statistically significant and positive effects on the usefulness of tacit knowledge sharing. Increases in personal motivation and in access to tacit knowledge sharing are related to increases in the usefulness of tacit knowledge sharing. When comparing the standardized coefficients between personal motivation (β=.23) and access to tacit knowledge sharing (β=.65), the latter affected the usefulness of tacit knowledge sharing more than the former.

Fourth, the time devoted to tacit knowledge sharing was significantly associated with personal motivation and red tape. Personal motivation had a positive effect, but red tape had a negative effect on reported time devoted to tacit knowledge sharing.

Fifth, the time devoted and access to tacit knowledge sharing are significantly related to changes in foster care rates. An increase of one standard deviation in the time devoted to tacit knowledge sharing is related to about a 0.2 standard deviation increase in foster care rates, but an increase of one standard deviation in access to tacit knowledge sharing is related to about a 0.2 standard deviation decrease in foster care rates. An increase of one unit in time devoted to tacit knowledge sharing is associated with more than a 0.18 standard deviation increase in changes in foster care rates, and a one standard deviation increase in access to tacit knowledge sharing is associated with over a 0.27 standard deviation decrease in changes in foster care rates. However, unlike the results of regression analysis, time devoted to explicit knowledge sharing is not significantly related to variation in child abuse or neglect rates. Therefore, one cannot conclude based on these results that time devoted to explicit knowledge sharing influences CPS program performance directly.

Figure 4-1: Path Diagram: Knowledge Sharing, Personal Motivation, Red Tape, and CPS Program Performance



Note: CANR (Changes in child abuse or neglect rates), CFCR (Changes in foster care rates), TEKS (Time of explicit knowledge sharing), UEKS (Usefulness of explicit knowledge sharing), AEKS (Access to explicit knowledge sharing), TTKS (Time of tacit knowledge sharing), UTKS (Usefulness of tacit knowledge sharing), ATKS (Access to tacit knowledge sharing), PM (Personal motivation), RT (Red tape)

Table 4-37: Summary of Path Analysis Results: Knowledge Sharing, Personal Motivation, Red Tape, and CPS Program Performance

Path			Standardized Direct Effects	Standardized Indirect Effects	Standardized Total Effects	Unstandardized Effects
Changes in Foster Care Rates	→	Changes in Child Abuse or Neglect Rates	-0.606***	0.000***	-0.606***	-0.387***
Time devoted to Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.084	0.018	0.101	0.160
Time devoted to Explicit Knowledge Sharing	→	Changes in Foster Care Rates	-0.115	0.020	-0.095	-0.345

Time devoted to Explicit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.176**	-0.002**	0.174**	0.190**
Usefulness of Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	-0.224***	-0.071***	-0.296***	-0.398***
Usefulness of Explicit Knowledge Sharing	→	Changes in Foster Care Rates	0.117	-0.002	0.115	0.325
Usefulness of Explicit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	-0.023	0.000	-0.023	-0.018
Access to Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.049	-0.06	-0.011	0.075
Access to Explicit Knowledge Sharing	→	Changes in Foster Care Rates	0.058	0.010	0.068	0.139
Access to Explicit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.084	-0.001	0.084	0.073
Time devoted to Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.028	-0.113	-0.085	0.059
Time devoted to Tacit Knowledge Sharing	→	Changes in Foster Care Rates	0.189**	0.009**	0.198**	0.615**
Time devoted to Tacit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	0.090	-0.001	0.089	0.081
Usefulness of Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.165	-0.153	0.012	0.380
Usefulness of Tacit Knowledge Sharing	→	Changes in Foster Care Rates	0.060	0.045	0.105	0.216
Usefulness of Tacit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.396***	-0.004***	0.392***	0.514***
Access to Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	-0.154	0.175	0.020	-0.295
Access to Tacit Knowledge	→	Changes in Foster Care	-0.275**	0.069**	-0.206**	-0.824**

Sharing		Rates				
Access to Tacit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	0.659***	-0.006***	0.653***	0.546***
Personal Motivation	→	Time devoted to Tacit Knowledge Sharing	0.179**	0.000**	0.179**	0.265**
Personal Motivation	→	Usefulness of Tacit Knowledge Sharing	0.222***	0.014***	0.236***	0.295***
Red Tape	→	Usefulness of Explicit Knowledge Sharing	-0.185**	-0.005**	-0.190**	-0.155**
Red Tape	→	Time devoted to Tacit Knowledge Sharing	-0.182**	0.000**	-0.182**	-0.129**

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

4.4.2. Path diagram: full model

This model includes knowledge sharing, personal motivation, red tape, economic conditions, staffers' professionalism, and financial resources. Figure 4-2 shows the causal relationships for the model with all of the variables; Table 4-38 shows the specific path coefficients.[60] First, unlike the finding of the first path analysis, time devoted to explicit knowledge sharing is significantly and positively associated with variation in child abuse or neglect rates. An increase of one standard deviation in time devoted to explicit knowledge sharing was related to almost a 0.13 standard deviation increase in child abuse or neglect rates. This suggests that spending more time in sharing explicit knowledge lowered CPS program

[60] I do not explain all the patterns of causation mentioned in Figure 4-1 to reduce duplication.

performance, at least as measured by child abuse or neglect rates. Based on the results of this analysis, one might argue that only when time devoted to explicit knowledge sharing is linked to considering explicit knowledge sharing to be useful is CPS program performance likely to improve. An increase of one standard deviation in the reported usefulness of explicit knowledge sharing led to more than a 0.18 standard deviation decrease in changes in child abuse or neglect rates. However, access to tacit knowledge sharing is not significantly related to changes in foster care rates in this model.

Second, economic conditions and work training of CPS staffers are significantly related to variation in changes in child abuse or neglect rates. Increases in median household income and in unemployment rates are associated with increases in child abuse or neglect rates. An increase of one standard deviation in median household income is associated with over a 0.26 standard deviation increase in child abuse or neglect rates. One standard deviation increase in the local unemployment rate is associated with almost a 0.26 standard deviation increase in child abuse or neglect rates. In contrast, an increase of one standard deviation in the frequency of work training of CPS workers produced more than a 0.14 decrease of standard deviation in changes in child abuse or neglect rates. That is, increases in work training of CPS workers contributed at least slightly to improvement of CPS program performance.

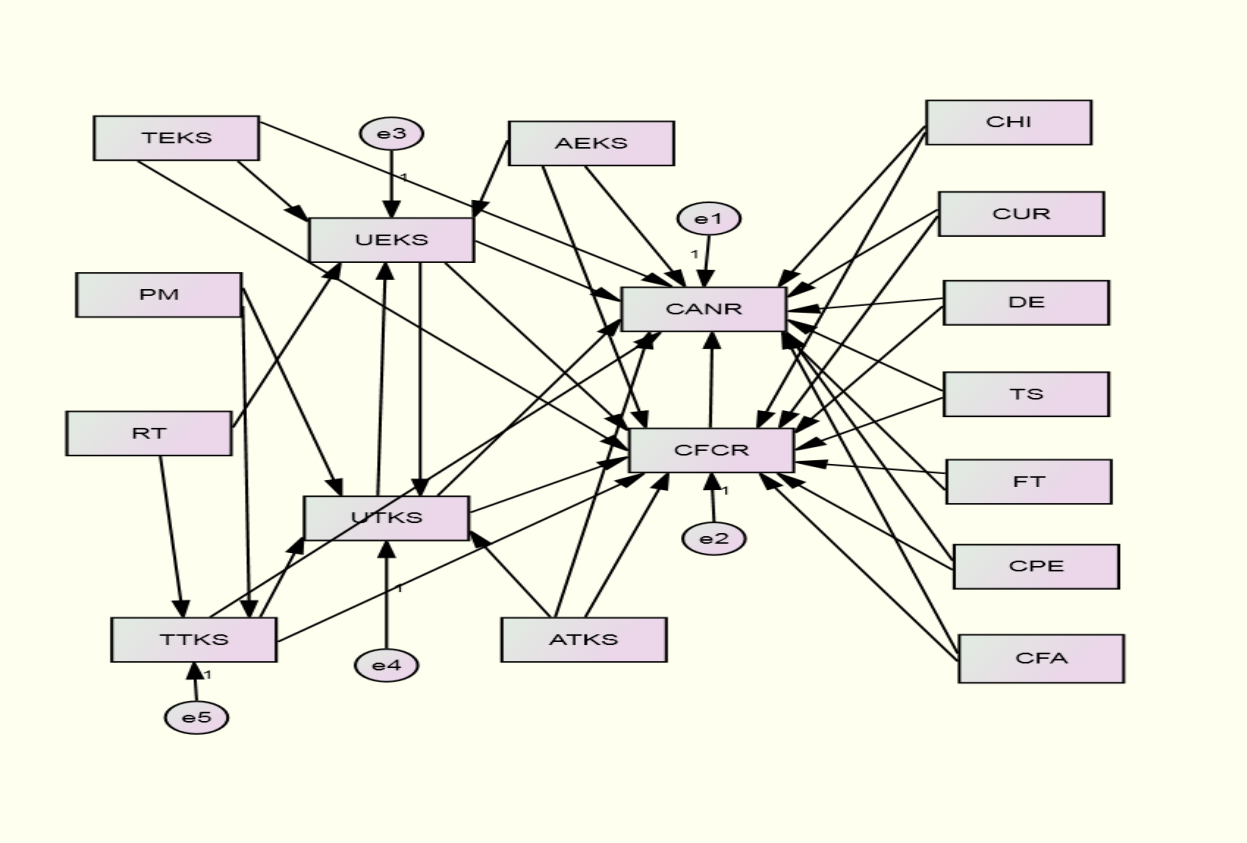
Third, localities in which CPS staffers have more education tend to have lower foster care rates. Perhaps such staffers are better able to address the problems of abused or neglected children without placing the children in foster care. In addition, where CPS staffers have had more work training, child abuse or neglect rates tended to decrease. Foster care rates

in localities in which CPS staffers have more education are lower than those in localities in which CPS have less education. As well, changes in foster care rates are negatively related to changes in child abuse or neglect rates. An increase of one standard deviation in changes in foster care rates produces more than a 0.72 standard deviation decrease in changes in child abuse or neglect rates.

Fourth, CPS program expenditures are significantly related to changes in foster care rates. An increase of one standard deviation in CPS program expenditures leads to more than a 0.33 standard deviation increase in changes in foster care rates. Increases in CPS program expenditures may help agencies in supporting more foster care placements.

Fifth, increases in family assessment are significantly associated with increases both in child abuse or neglect rates and in foster care rates. One standard deviation increase in family assessments is related to more than a 0.38 increase of standard deviation in child abuse or neglect rates as well as over a 0.45 standard deviation increase in foster care rates. Unless family assessments provide more fundamental solutions to families with abused or neglected children, children in family assessments evidently are somewhat more likely to continue to be abused or neglected.

Figure 4-2: Path Diagram: Full Model



Note: CANR (Changes in child abuse or neglect rates), CFCR (Changes in foster care rates), TEKS (Time of explicit knowledge sharing), UEKS (Usefulness of explicit knowledge sharing), AEKS (Access to explicit knowledge sharing), TTKS (Time of tacit knowledge sharing), UTKS (Usefulness of tacit knowledge sharing), ATKS (Access to tacit knowledge sharing), PM (Personal motivation), RT (Red tape), CHI (Changes in median household income), CUR (Changes in unemployment rate), DE (Degree of education), TS (Tenure as a CPS staffer), FT (Frequency of CPS work training), CPE (Changes in CPS program expenditures), CFA (Changes in family assessments)

Table 4-38: Summary of Path Analysis Results: Full Model

Path			Standardized Direct Effects	Standardized Indirect Effects	Standardized Total Effects	Unstandardized Effects
Changes in Foster Care Rates	→	Changes in Child Abuse or Neglect Rates	-0.723***	0.000***	-0.723***	-0.429***
Time devoted to Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.131**	0.005**	0.135**	0.257**
Time devoted to Explicit Knowledge Sharing	→	Changes in Foster Care Rates	-0.064	0.012	-0.052	-0.212

Time devoted to Explicit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.177**	-0.002**	0.175**	0.191**
Usefulness of Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	-0.183***	-0.051***	-0.233***	-0.334***
Usefulness of Explicit Knowledge Sharing	→	Changes in Foster Care Rates	0.070	0.000	0.07	0.214
Usefulness of Explicit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	-0.030	0.000	-0.029	-0.023
Access to Explicit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	-0.029	-0.068	-0.097	-0.046
Access to Explicit Knowledge Sharing	→	Changes in Foster Care Rates	0.067	0.006	0.073	0.179
Access to Explicit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.083	-0.001	0.082	0.072
Time devoted to Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.039	-0.120	-0.081	0.084
Time devoted to Tacit Knowledge Sharing	→	Changes in Foster Care Rates	0.168**	-0.002**	0.166**	0.606**
Time devoted to Tacit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	0.083	-0.001	0.082	0.075
Usefulness of Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	0.066	-0.052	0.014	0.157
Usefulness of Tacit Knowledge Sharing	→	Changes in Foster Care Rates	-0.056	0.028	-0.028	-0.222
Usefulness of Tacit Knowledge Sharing	→	Usefulness of Explicit Knowledge Sharing	0.397***	-0.005***	0.392***	0.514***
Access to Tacit Knowledge Sharing	→	Changes in Child Abuse or Neglect Rates	-0.085	0.114	0.029	-0.167
Access to Tacit Knowledge Sharing	→	Changes in Foster Care Rates	-0.144	-0.018	-0.163	-0.479
Access to Tacit Knowledge Sharing	→	Usefulness of Tacit Knowledge Sharing	0.666***	-0.008***	0.659***	0.554***
Personal Motivation	→	Time devoted to Tacit Knowledge Sharing	0.179**	0.000**	0.179**	0.266**

Personal Motivation	→	Usefulness of Tacit Knowledge Sharing	0.236***	0.012***	0.248***	0.316***
Red Tape	→	Usefulness of Explicit Knowledge Sharing	-0.185**	-0.004**	-0.188**	-0.154**
Red Tape	→	Time devoted to Tacit Knowledge Sharing	-0.180**	0.000**	-0.18**	-0.128**
Changes in Median Household Income	→	Changes in Child Abuse or Neglect Rates	0.267***	0.077***	0.344***	0.025***
Changes in Median Household Income	→	Changes in Foster Care Rates	-0.106	0.000	-0.106	-0.017
Changes in Unemployment Rate	→	Changes in Child Abuse or Neglect Rates	0.257***	-0.063***	0.194***	0.793***
Changes in Unemployment Rate	→	Changes in Foster Care Rates	0.087	0.000	0.087	0.451
Degree of Education	→	Changes in Child Abuse or Neglect Rates	-0.065	0.123	0.058	-0.263
Degree of Education	→	Changes in Foster Care Rates	-0.170**	0.000**	-0.170**	-1.159**
Tenure as a CPS Staffer	→	Changes in Child Abuse or Neglect Rates	-0.006	-0.059	-0.065	-0.009
Tenure as a CPS Staffer	→	Changes in Foster Care Rates	0.082	0.000	0.082	0.192
Frequency of CPS Work Training	→	Changes in Child Abuse or Neglect Rates	-0.147**	0.029**	-0.118**	-0.204**
Frequency of CPS Work Training	→	Changes in Foster Care Rates	-0.040	0.000	-0.04	-0.093
Changes in CPS Program Expenditures	→	Changes in Child Abuse or Neglect Rates	0.107	-0.240	-0.133	0.000
Changes in CPS Program Expenditures	→	Changes in Foster Care Rates	0.332***	0.000***	0.332***	0.002***
Changes in Family Assessments	→	Changes in Child Abuse or Neglect Rates	0.386***	-0.327***	0.058***	0.011***
Changes in Family Assessments	→	Changes in Foster Care Rates	0.453***	0.000***	0.453***	0.022***

Note: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Summary

The path analyses allowed further probing of the patterns of causation among knowledge sharing, individual, organizational, and alternative explanatory factors, and CPS program performance, indicating both direct and indirect effects. The first path analysis in Figure 4-1 was used to look more clearly at the relationships among knowledge sharing, personal motivation, red tape, and CPS program performance. The results again show that knowledge sharing is related to CPS program performance. For example, an increase of one standard deviation in the reported usefulness of explicit knowledge sharing is related to over a 0.29 standard deviation decrease in child abuse or neglect rates. Time devoted to and access to tacit knowledge sharing is significantly related to changes in foster care rates. An increase of one standard deviation in time devoted to tacit knowledge sharing is related to over a 0.19 standard deviation increase in foster care rates, and an increase of one standard deviation in access to tacit knowledge sharing is related to over a 0.20 standard deviation decrease in foster care rates. An increase of one standard deviation in changes in the reported usefulness of explicit knowledge sharing produces over a 0.22 standard deviation decrease in changes in child abuse or neglect rates. An increase of one standard deviation in time devoted to tacit knowledge sharing leads to almost a 0.19 standard deviation increase in foster care rates, and a one standard deviation increase in access to tacit knowledge sharing produces over a 0.27 standard deviation decrease in foster care rates.

The second path analysis included all of the variables. First, the usefulness of and the time devoted to explicit knowledge sharing remain significantly related to changes in child

abuse or neglect rates. An increase of one standard deviation in changes in the reported usefulness of explicit knowledge sharing leads to more than a 0.18 standard deviation decrease in changes in child abuse or neglect rates. A one standard deviation increase in time devoted to explicit knowledge sharing produces about a 0.13 standard deviation increase in child abuse or neglect rates.

Second, only time devoted to tacit knowledge sharing is significantly related to changes in foster care rates. An increase of one standard deviation in time devoted to tacit knowledge sharing is related to more than a 0.16 standard deviation increase in changes in foster care rates. Yet foster care rates are negatively associated with child abuse rates. An increase of one standard deviation in foster care rates produces more than a 0.72 standard deviation decrease in child abuse or neglect rates.

Based on these effects of knowledge sharing on CPS program performance at the individual-level, the next section examines its effects in several of the 23 jurisdictions highlighted here.

4.5. Knowledge sharing and CPS program performance in specific localities

This chapter's analysis showed that knowledge sharing by CPS staffers affected CPS program performance. To get a somewhat more concrete look at knowledge sharing and program performance in the localities, I organized reported knowledge sharing, economic conditions, and CPS program expenditures according to the results of CPS program performance in the 23 focal jurisdictions.

Child abuse or neglect rates between 2007 and 2009 in Tazewell County, the City of Norfolk, and the City of Richmond decreased more than in any of the other 23 jurisdictions. In contrast, child abuse or neglect rates in the cities of Charlottesville and Suffolk and in Wise County increased more between 2007 and 2009 than in any of the other localities. A general profile of these six jurisdictions appears in Table 4-39.

Table 4-39: General Profile of Six Jurisdictions

Locality	Population (Total)	Population (aged 0-17)	Median household Income(2009)	The number of the poor (under 18)	Unemployment Rate (2009)	Social /welfare expenditures (2008)
Tazewell County	44,907	9,191	$36,143	1,961	7.6%	$ 6,942,882
Norfolk City	233,333	60,618	$41,161	14,190	8.4%	$82,301,119
Richmond City	204,451	44,383	$37,115	13,912	9.5%	$105,387,173
Charlottesville City	42,218	6,786	$39,030	1,406	6.4%	$25,952,235
Suffolk City	83,659	21,191	$56,300	3,779	6.6%	$14,588,596
Wise County	41,773	8,876	$35,053	2,396	7.0%	$8,290,874

Sources: U.S. Census Bureau, U.S. Department of Labor, Virginia auditor of public accounts

The three jurisdictions with the greatest increases in child abuse/neglect rates had larger increases in median household income than did the three jurisdictions with the largest decreases in child abuse/neglect rates during the same period. Such a result contradicts the

expectation that median household income is inversely related to child abuse or neglect rates. In addition, the increases in unemployment rates in Norfolk and Richmond are higher than those in Charlottesville, Suffolk, and Wise County. Such results suggest limitations in efforts to account for variations in child abuse or neglect by focusing only on economic difficulties.

At the same time, when I compare the levels of the reported usefulness of explicit knowledge sharing between the two groups of localities, officials in the jurisdictions with decreases in child abuse/neglect rates reported higher levels of usefulness of explicit knowledge sharing than did those in areas with increases in child abuse/neglect rates. This again suggests that the degree and helpfulness of explicit knowledge sharing in dealing with the work of child protective officials indeed may be related to improvement of local CPS program performance. (See Table 4-40.)

Table 4-40: Knowledge Sharing, Economic Conditions, Financial Resources, and Changes in Child Abuse/Neglect Rates: Six Jurisdictions

Locality	Changes in child abuse or neglect rates	Usefulness of explicit knowledge sharing	Usefulness of tacit knowledge sharing	Time devoted to explicit knowledge sharing	Time devoted to tacit knowledge sharing	Change in median household income	Change in unemployment rate	Change CPS program expenditures
Tazewell County	-5.60	6.00	6.00	4.00	4.00	$98	-0.10	$120,424
Norfolk City	-3.30	5.50	5.67	1.67	2.00	$85	1.19	$155,714
Richmond City	-2.00	6.33	6.33	2.33	2.67	$-1,333	1.51	$2,379,601
Wise County	2.70	5.38	6.25	2.50	3.25	$583	0.63	$65,234
Suffolk City	3.20	4.67	4.50	3.00	2.67	$27	0.85	$640,526

Charlottesville City	6.90	5.00	6.75	3.00	2.75	$5,753	0.87	$416,627

CPS staffers in Tazewell County, Norfolk, and Richmond generally perceived explicit knowledge sharing to be more useful than did those who work in Charlottesville, Suffolk, and Wise County. Moreover, the low standard deviations on the usefulness of explicit knowledge sharing among the respondents in Norfolk (SD=0.50) and Richmond (SD=0.52) indicate that most of the staffers surveyed perceived explicit knowledge sharing to be quite useful. In contrast, the higher standard deviations in Charlottesville (SD=2.16), Suffolk (SD=3.21), and Wise County (SD=0.95) suggest that respondents in those localities have more mixed perceptions of the usefulness of explicit knowledge sharing. (See Table 4-41.)

Table 4-41: Usefulness of Knowledge Sharing: Six Jurisdictions

	Usefulness of explicit knowledge sharing				
Locality	N	Minimum	Maximum	Mean	Std. Deviation
Tazewell	1	6.00	6.00	6.00	.
Norfolk	3	5.00	6.00	5.50	0.50
Richmond	6	6.00	7.00	6.33	0.52
Charlottesville	4	2.00	7.00	5.00	2.16
Suffolk	3	1.00	7.00	4.67	3.21
Wise	4	4.00	6.00	5.38	0.95

Examination of the relationships between knowledge sharing and changes in foster care rates yields different results. Table 4-42 arranges the 23 counties and cities from the least to the greatest change in foster care rates between 2007 and 2009. Few patterns appear in the relationships between foster care rates and levels either of the usefulness of explicit and tacit knowledge sharing or of the time devoted to explicit and tacit knowledge sharing.

Table 4-42: Locality Ranking by Changes in Foster Care Rates

Locality	Change in foster care rate	Usefulness of explicit knowledge sharing	Usefulness of tacit knowledge sharing	Time devoted to explicit knowledge sharing	Time devoted to tacit knowledge sharing	Change in median household income	Change in unemployment rate	Change in CPS program expenditure
Charlottesville	-8.53	5.00	6.75	3.00	2.75	$5,753	0.87	$416,627
Portsmouth	-2.32	5.67	6.33	2.67	2.33	$2,352	1.00	$184,770
Suffolk	-1.45	4.67	4.50	3.00	2.67	$27	0.85	$640,526
Alexandria	-0.53	6.67	6.17	2.17	2.83	$3,720	0.59	$950,540
Chesapeake	-0.43	6.40	6.40	2.20	2.80	$4,066	0.90	$954,320
Newport News	-0.42	5.88	5.96	2.50	2.75	$3,962	1.11	$934,002
Lynchburg	-0.36	6.50	6.81	2.00	3.00	$3,066	1.05	$1,138,991
Campbell	-0.33	6.75	6.83	3.17	3.50	$-586	0.64	$252,692
Prince William	-0.27	5.70	6.40	2.80	2.60	$1,679	0.84	$764,100
Hampton	-0.26	5.25	5.75	2.00	1.50	$839	1.24	$613,237
Roanoke County	-0.15	5.80	6.40	2.40	2.80	$-115	0.70	$625,790
Spotsylvania	-0.13	4.50	5.67	1.33	2.67	$3,087	0.88	$241,973
James City County	-0.09	6.00	7.00	2.50	3.75	$6,218	0.71	$94,104
York/Poquoson	-0.05	7.00	6.50	2.00	2.00	$809	0.80	$179,170
Henry-Martinsville	-0.05	6.50	6.75	2.33	3.00	$-1,445	3.24	$92,086
Stafford	-0.04	6.00	7.00	2.00	4.00	$280	0.82	$476,650
Wise	-0.03	5.38	6.25	2.50	3.25	$583	0.63	$65,234
Henrico	0.10	6.00	6.78	1.67	2.89	$3,106	0.93	$762,885
Norfolk	0.20	5.50	5.67	1.67	2.00	$85	1.19	$155,714
Danville	0.42	6.42	6.17	2.33	3.00	$1,143	2.29	$355,577
Richmond City	0.65	6.33	6.33	2.33	2.67	$-1,333	1.51	$2,379,601
Tazewell	6.10	6.00	6.00	4.00	4.00	$98	-0.10	$120,424

Albemarle	11.15	5.60	6.50	2.40	3.40	$2,987	0.74	$885,039

CFCR: Change of foster care rates, UEK: Usefulness of explicit knowledge sharing, UTK: Usefulness of tacit knowledge sharing, TEK: Time of explicit knowledge sharing, TTK: Time of tacit knowledge sharing, CHI: Change of household income (2008-2007), CUER: Change of unemployment rates (2008-2007), CPE: Change of CPS program expenditure (2008-2007)

Summary

This chapter analyzed the relationships between CPS program performance and explicit and tacit knowledge sharing, personal motivation, red tape, and several alternative explanatory factors. The analyses revealed several meaningful findings. First, CPS staffers report spending time sharing explicit as well as tacit knowledge. As the whole, they believe that explicit and tacit knowledge sharing is useful in dealing with their work and that they can easily access such knowledge.

Second, this study examined alternative explanatory factors affecting CPS program performance at the jurisdictional level to help isolate the effects of knowledge sharing on CPS program performance. When comparing all jurisdictions in Virginia with the 23 jurisdictions whose officials responded to the survey, I found that effects of economic conditions and CPS program financial resources on CPS program performance were quite similar.

Moreover, finding that changes in median household income were positively associated with changes in child abuse or neglect rates may suggest that factors internal to the CPS program such as knowledge sharing among street-level bureaucrats are important to program performance. It underscores as well the difficulties introduced by lack of access to even aggregated case files in each jurisdiction.

Third, analyses using the survey data involved three steps to identify the relationships between knowledge sharing, individual and organizational factors, alternative explanatory factors, and CPS program performance. Throughout, the reported usefulness of explicit knowledge sharing was related to CPS program performance; the more CPS staffers believed that explicit knowledge sharing was useful in handling their work, the better the CPS program performance. As well, even though tacit knowledge sharing turned out not to affect CPS program performance directly, path analysis showed that tacit knowledge sharing can affect CPS program performance through explicit knowledge sharing.

Fourth, personal motivation and red tape also affected CPS program performance indirectly. The second step of the analysis showed that red tape affects explicit knowledge sharing more than tacit knowledge sharing. Yet, personal motivation affected tacit knowledge sharing rather than explicit knowledge sharing.

These findings support the importance of knowledge sharing in improving CPS program performance. By showing various relationships between knowledge sharing and individual and organizational factors, the study highlights the importance of personal motivation and red tape in inducing active knowledge sharing. The next chapter discusses the implications of these findings.

CHAPTER 5 Conclusions

Government programs have to deal with diverse problems. How well they perform depends on how the programs and those who work in them handle such problems. It is not easy to handle social problems, in part because social problems and needs have been getting more complex. Knowledge is required to address these complex problems. Knowledge can be expanded by sharing knowledge. Even though knowledge and knowledge sharing are important in government programs, the effects of knowledge sharing have been little examined. The study focused on the effects of knowledge sharing by street-level bureaucrats on program performance, while also paying attention to the possible influences of other individual and organizational factors. The tests of these relationships showed several dynamic relationships. This chapter begins by summarizing the results of the study. Then, those results are used to highlight the answers to the initial research questions. After doing so, several implications of the findings for public management and policy are explored. The chapter turns next to the limitations of the study and then proposes ideas for future research.

5.1. Summary of findings

The study began with the purpose of finding out more about the role of knowledge sharing in program performance, since little research exists on the effects of knowledge sharing on program performance. The study yielded several results. First, at the jurisdictional level there is evidence that explicit knowledge sharing in localities played an important role in

affecting CPS program performance. Explicit knowledge sharing at the jurisdictional level was linked to decreases in child abuse or neglect rates, holding economic conditions constant.

Second, at the individual level CPS staffers reported relatively high levels of explicit and tacit knowledge sharing and that they shared tacit knowledge more than explicit knowledge. Only the reported usefulness of explicit knowledge sharing affected CPS program performance, while the usefulness of tacit knowledge sharing and time devoted to explicit knowledge sharing affected usefulness of explicit knowledge sharing. Personal motivation of CPS staffers affected program performance through tacit knowledge sharing, and red tape evidently affected CPS program performance by decreasing explicit and tacit knowledge sharing. Even when factors like local economic conditions and available financial resources were added to the explanation, usefulness of explicit knowledge sharing still affected CPS program performance. Path analysis confirmed that the usefulness of explicit knowledge sharing affected CPS program performance positively. Path analysis showed that although time devoted to explicit knowledge sharing had a negative effect on CPS program performance directly, it affected CPS program performance positively by increasing the usefulness of explicit knowledge sharing.

The results of analyses showed the effects of explicit and tacit knowledge on CPS program performance. In sum, explicit and tacit knowledge sharing by CPS staffers was related to CPS program performance. However, the effects of explicit and tacit knowledge sharing on CPS performance were not the same: explicit knowledge sharing had a direct effect on changes in child abuse or neglect rates, and tacit knowledge sharing had only an indirect effect on it. On the other hand, tacit knowledge sharing is directly related to changes in foster care rates.

Second, the results of the analyses showed that the relationships among time devoted to, usefulness of, and access to explicit and tacit knowledge sharing were diverse. For example, the time devoted to and the usefulness of tacit knowledge sharing were related to the usefulness of explicit knowledge sharing. Access to tacit knowledge sharing was related only to the reported usefulness of tacit knowledge sharing. These diverse relationships showed that although all aspects of knowledge sharing affected directly CPS program performance, they affected CPS program performance through the reported usefulness of explicit and tacit knowledge sharing.

Third, individual and organizational factors influenced the relationship between knowledge sharing and CPS program performance. Even though personal motivation and red tape were not related to CPS program performance directly, they were associated with CPS program performance through knowledge sharing. For example, staffers' personal motivation was made them more likely to devote time to sharing tacit knowledge and to report that tacit knowledge sharing was useful. Red tape was associated with explicit knowledge sharing being seen as less useful and with less time devoted to tacit knowledge sharing. Personal motivation had a positive effect on tacit knowledge sharing, but red tape appeared to have a negative effect on explicit and tacit knowledge sharing.

Fourth, the study showed that several factors other than knowledge sharing also affected CPS program performance. For example, local economic conditions (changes in median household income and in unemployment rates), work training of CPS staffers, and family assessments affected changes in child abuse or neglect rates. Meanwhile, foster care rates rose

with increased CPS staffer education, additional budgetary resources, and more emphasis on family assessments. In addition, the effect of knowledge sharing on CPS program performance was isolated. When controlling for alternative factors that seemed likely to affect CPS program performance, knowledge sharing remained related to CPS program performance. For example, reported usefulness of explicit knowledge sharing still had a positive effect on CPS program performance.

Fifth, the evidence did not support some of the hypothesized relationships, and in several instances the relationships were in the opposite direction. For example, increases in median household income were associated with increases in child abuse or neglect rates, counter to the expectation that median household income would be negatively related to child abuse or neglect rates. This finding may have occurred if median household income were related to the time spent working by children's guardians. When primary caregivers such as parents earn more income, they may have to spend in working rather than in taking care of their children. As another example, even though time devoted to explicit knowledge sharing was hypothesized to be negatively related to child abuse or neglect rates, the result showed the relationship between them was positive. Addressing cases of abused or neglected children in a timely fashion is important in efforts to reduce child abuse or neglect rates. It may be that caseworkers who spend time sharing explicit knowledge may have less time to handle cases of abused or neglected children. This may be an especially difficult tradeoff in times of staff or budget reductions. It also may be that increases in child abuse or neglect in an area push

caseworkers to spend more time gathering information from databases and other formally available material; that is, the causal flow may be the reverse of what I hypothesized.

Knowledge sharing definitely played a role affecting CPS program performance. These findings in turn highlight the need for more research on knowledge sharing over longer periods and in different settings.

5.2. Implications

The results of the study have several implications for public management and policy scholars and for practitioners. First, the study points to the need for more attention to be paid to knowledge sharing in public management and policy. Even though some scholars have emphasized knowledge sharing, one dimension of knowledge management, scholarship in the public sector to this point has paid relatively little attention to knowledge management (Bate and Robert, 2002; Taylor and Wright, 2004; Willem and Buelens, 2007). The findings underscore the need for deeper investigation of knowledge sharing when looking for influences on public program performance.

Second, the results suggest various reasons for and benefits of differentiating between explicit knowledge sharing and tacit knowledge sharing. First of all, despite the conceptual distinction between explicit and tacit knowledge that Nonaka (1994) introduced, little scholarship focuses on the relationships between the two types of knowledge and policy or program performance. However, as the findings of this study show, the two types evidently have different effects on program performance. For example, although explicit knowledge sharing directly affected CPS program performance, tacit knowledge sharing evidently

influenced CPS program performance indirectly through explicit knowledge sharing. In working to improve program performance, public managers have to discover more about how to improve explicit knowledge sharing rather than relying only on tacit knowledge sharing.

Although some scholars see the conversion between explicit and tacit knowledge as operating in both directions (Nonaka, 1994; Nonaka and Von Krogh, 2009), this study found that the reported usefulness of tacit knowledge sharing had a positive effect on the perceived usefulness of explicit knowledge sharing, but not the reverse. Thus, the process of tacit knowledge sharing may help improve explicit knowledge sharing, but we cannot say that explicit knowledge sharing improves tacit knowledge sharing.

In addition, individual and organizational factors apparently affect explicit knowledge sharing and tacit knowledge sharing differently. Existing scholarship found the effects of individual and organizational factors on knowledge sharing generally, but it does not differentiate between the two types of knowledge. By finding different effects of individual and organizational factors on explicit and tacit knowledge sharing, this study shows the utility of differentiating between explicit and tacit knowledge.

Lastly, varying dimensions of knowledge sharing such as the time devoted to, the perceived usefulness of, and access to knowledge sharing have different effects on explicit and tacit knowledge sharing. For example, the reported usefulness of explicit knowledge sharing was affected by the time devoted to such knowledge sharing and by the perceived usefulness of tacit knowledge sharing; yet the usefulness of tacit knowledge sharing was associated only with access to tacit knowledge sharing.

Third, the findings of the study emphasize the importance of street-level bureaucrats and the effects of their knowledge sharing on program performance. After Lipsky's study of the influence of street-level bureaucrats on program performance (1971), there have been many analyses of street-level bureaucrats. Scholars have taken primarily two approaches, focusing on the desirability of the influence of street-level workers. One argument emphasizes constraining street-level discretion, while the other accepts its influence on successful policy implementation (May and Winter, 2009). This research showed the positive effects of street-level bureaucrats on program performance, highlighting the potential influence of knowledge sharing. CPS staffers' skills, know-how, information, and senses were involved in diagnosing and handling problems, which in turn are very important to program performance. Sharing practical and useful knowledge acquired by the diverse experiences of street-level bureaucrats can help to improve their implementation capacities. As a result, improved abilities to handle work through knowledge sharing may help enhance program performance. This is consistent with the argument that the roles, actions, and judgments of front-line workers at the technical level affect program performance (Lynn, et al., 2001). In addition, this study may deepen understanding of street-level bureaucrats by showing the positive effects of their knowledge sharing on program performance. The results provide the evidence that it is important to consider how to share explicit and tacit knowledge sharing between street-level bureaucrats for better performance.

Fourth, the results of the study expand understanding of the possible effects of Individual and organizational contexts on knowledge sharing. Previous scholarship that

reported that individual and organizational factors affect knowledge sharing is consistent with the results of this study (Gagné, 2009; Kang, et al., 2008; Kim and Lee, 2006). It further contributes to such work by showing different effects of individual and organizational factors on explicit and tacit knowledge sharing. Personal motivation was closely related with tacit knowledge sharing, but red tape was associated with both explicit and tacit knowledge sharing. In addition, the findings suggest that personal motivation and red tape can affect program performance indirectly through knowledge sharing.

Fifth, this study suggests the critical nature of designing effective knowledge sharing system and environments. Knowledge sharing at the jurisdictional level is also important for effective program performance. Explicit knowledge sharing that is acquired by paper and electronic documents had a direct effect on CPS program performance. For improved program performance, more effective explicit knowledge sharing systems would appear to be required. For example, easier to use and more convenient electronic systems or the reduction of red tape might help CPS staffers share more explicit knowledge, which in turn can result in improved program performance. In addition to construction of technical systems, leadership that encourages CPS staffers to share their explicit and tacit knowledge also may improve CPS program performance.

5.3. Limitations of the research

This study has several limitations. First, the measures of some independent variables depend primarily on respondents' perceptions and beliefs. For example, knowledge sharing, personal motivation, and red tape were tapped by individual subjective beliefs and perceptions,

while CPS program performance was measured by more objective indicators. However, by examining other independent variables such as economic factors, staffers' professionalism, and financial resources by objective indicators, the study tried to reduce this limitation.

Second, the results of the study are based on the responses of CPS officials in 23 localities in Virginia. To check for selection bias, dimensions such as median household income, unemployment rates, and CPS program expenditures were compared between all jurisdictions in Virginia and the 23 jurisdictions. The directions of the effects of these variables on CPS program performance were similar. Therefore, the results of looking at survey data from the 23 jurisdictions can be seen to be at least as being somewhat representative of other Virginia counties and cities.

5.4. Suggestions for future research

The study suggests several areas for future research. First, it is possible to study the relationships between knowledge sharing and program performance in other program or policy areas. Even though this study focused on the CPS program in Virginia, the study of knowledge sharing does not need to be limited to certain policy or program areas. Other policies and programs such as those in health, environmental, energy and science-technology policy also are likely to be affected by knowledge sharing.

Second, more diverse individual and organizational factors can be examined to study the relationships between knowledge sharing and program performance. This study examined public service motivation and self-set goals as individual factors and red tape as an organizational factor. In addition, other individual and organizational factors (e.g., IT

friendliness, centralization, leadership, and reward system) may affect the relationships between knowledge sharing and program performance. Study of other individual and organizational factors may help the construction of more effective knowledge sharing systems.

Third, the relationship between knowledge sharing and performance can be examined at different levels of analysis. Explicit and tacit knowledge can be shared among diverse actors. For example, knowledge sharing between internal organizational actors or with outside entities is possible. As well, knowledge sharing can affect performance of different levels. For example, the effects of explicit and tacit knowledge sharing on the performance of individual-level, group-level, organizational level, and network-level actors can be examined.

5.5. Concluding words

Government program performance is affected by institutional, organizational, and technical factors (Lynn, et al., 2001). Much research on program performance has been interested in institutional and organizational factors. However, one should remember that technical factors can affect government program performance. At the core of technical factors is the knowledge of governmental officials. The knowledge of street-level bureaucrats who handle actual problems face to face is expanded by sharing their explicit or tacit knowledge. This study showed that sharing explicit and tacit knowledge can help street-level bureaucrats deal appropriately and effectively with the situations they face, which may lead to better program performance. This in turn calls for more studies of knowledge and knowledge management including knowledge sharing by street-level bureaucrats in hopes of attaining better program performance.

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Appendix A: IRB approval

MEMORANDUM

DATE: June 23, 2010

TO: Karen M. Hult, Dongshin Kim

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires June 13, 2011)

PROTOCOL TITLE: The Effect of Knowledge Sharing on Program Performance: Knowledge, Individual and Organizational Contexts, and CPS Program Performance

IRB NUMBER: 10-421

Effective June 23, 2010, the Virginia Tech IRB Chair, Dr. David M. Moore, approved the amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects.

Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at http://www.irb.vt.edu/pages/responsibilities.htm (please review before the commencement of your research).

PROTOCOL INFORMATION:

Approved as: **Exempt, under 45 CFR 46.101(b) category(ies) 2, 4**

Protocol Approval Date: **6/11/2010**

Protocol Expiration Date: **NA**

Continuing Review Due Date*: **NA**

*Date a Continuing Review application is due to the IRB office if human subject activities covered

under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federally regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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Appendix B: Survey

This survey is designed to gather opinions from social workers and supervisors in the Virginia Child Protective Services program in order to better understand how the program operates. The survey is for academic purposes only, and it is completely confidential. Your identity will never be revealed or linked to your responses. The survey is short, and it will take less than 15 minutes to complete.

For each statement below, please click on the one response option that best fits your experience or views. Whenever you want to change your answers, you can do so any time before submitting the survey. After completing the survey, please click the submit button at the end of the survey.

1. In a typical day, how many times do you look for guidance paper or electronic documents (e.g. CPS procedures, OASIS) for your work?
   1) Rarely if ever
   2) Once or twice a day
   3) 3-5 times a day
   4) 6 times or more

2. In a typical week, how many times do you have discussions or meetings for your work?
   1) Less than once a week
   2) Once or twice a week
   3) 4-5 times a week (almost once every day)
   4) More than six times a week (more than once every day)

For each of the following, please indicate how strongly you agree or disagree.

3. I find and share know-how, information, and knowledge through paper or electronic documents (e.g. CPS procedures, OASIS).
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

4. Knowledge, information, and know-how in paper or electronic documents (e.g. CPS procedures, OASIS) help me to handle my caseload.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

5. I can easily access paper or electronic documents, information, and knowledge that others in my unit have.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

6. I find and share know-how, information, and knowledge through discussions, meetings, or collaboration.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

7. The knowledge I get from discussions, meetings, or working with others (e.g., co-workers, teachers, police officers) is helpful.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

8. I can easily keep in touch with others to communicate about their experiences, knowledge, and stories about work.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

Next are several questions that ask about your views of your work. Again, please choose the response that fits best.

9. The work I do as a CPS staff member is very important to me.
   1) Strongly agree
   2) Agree
   3) Agree somewhat
   4) Neither agree nor disagree
   5) Disagree somewhat
   6) Disagree
   7) Strongly disagree

10. I am not afraid to go to bat for the rights of others even if it means I will be ridiculed.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

11. Making a difference in society means more to me than my own personal achievements.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

12. I understand exactly what I am supposed to do as a CPS staffer.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

13. The goals I set for my work are challenging.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

14. I have specific and clear goals to aim for as a CPS staffer.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

15. Communication within my agency is too restricted by policies and procedures.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

16. Communication with outside organizations such as schools, police departments, or hospitals is too restricted by policies and procedures.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

17. Budgeting rules and procedures limit CPS's ability to deal with unexpected problems.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

18. Too many documents and procedures are involved in reporting on each case.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

19. Rules and procedures make it difficult to use new ideas to handle cases.
    1) Strongly agree
    2) Agree
    3) Agree somewhat
    4) Neither agree nor disagree
    5) Disagree somewhat
    6) Disagree
    7) Strongly disagree

Please provide some information about yourself.

20. Are you:
    1) Female?
    2) Male?

21. What is your highest educational degree?
    1) High school diploma or equivalent
    2) 2 year college degree
    3) 4 year college degree
    4) Master's degree
    5) Ph. D.
    6) Other (Please specify:)

22. Regardless of the locality, how many years have you worked in child protective services?
    1) 0-5 years
    2) 6-10 years
    3) 11-15 years
    4) 15-20 years
    5) More than 20 years

23. Regardless of the locality, how many years have you worked as a social worker/caseworker?
    1) 0-5 years
    2) 6-10 years
    3) 11-15 years
    4) 16-20 years
    5) More than 20 years

24. Regardless of the locality, how many years have you worked as a supervisor?
    1) 0-5 years
    2) 6-10 years
    3) 11-15 years
    4) 16-20 years
    5) More than 20 years

25. How many times have you attended training related to CPS?
    1) 0-5 times
    2) 6-10 times
    3) 11-15 times
    4) 16-20 times
    5) More than 20 times

26. In a typical week, which of the following do you spend more of your time on than on anything else? (Please choose <u>one</u> response.)
    1) Intake
    2) Investigation
    3) Family assessment
    4) On-going services
    5) Supervision
    6) Other (Please specify:)

27. On average, when there is a report of abuse or neglect, how many times do you visit a child and/or their family before the case is closed?
    1) Once or twice
    2) Between 3 and 5 times
    3) Between 6 and 10 times
    4) More than 10 times

28. In which jurisdiction do you work? (Options are in alphabetical order; this information is for summary purposes only.)

Accomack	Albemarle	Alexandria	Alleghany-Covington
Amelia	Amherst	Appomattox	Arlington
Bath	Bedford	Bland	Botetourt
Bristol	Brunswick	Buchanan	Buckingham
Campbell	Caroline	Carroll	Charles
Charlotte	Charlottesville	Chesapeake	Chesterfield/Colonial Heights
Clarke	Craig	Culpeper	Cumberland
Danville	Dickenson	Dinwiddie	Essex
Fairfax	Fauquier	Floyd	Fluvanna
Franklin City	Franklin County	Frederick	Fredericksburg
Galax	Giles	Gloucester	Goochland
Grayson	Greene	Greensville/Emporia	Halifax
Hampton	Hanover	Harrisonburg-Rockingham	Henrico
Henry-Martinsville	Highland	Hopewell	Isle of Wight
James City County	King and Queen	King George	King William
Lancaster	Lee	Loudoun	Louisa
Lunenburg	Lynchburg	Madison	Manassas City
Manassas Park	Mathews	Mecklenburg	Middlesex
Montgomery	Nelson	New Kent	Newport News
Norfolk	Northampton	Northumberland	Norton City
Nottoway	Orange	Page	Patrick
Petersburg	Pittsylvania	Portsmouth	Powhatan
Prince Edward	Prince George	Prince William	Pulaski
Radford City	Rappahannock	Richmond City	Richmond County
Roanoke City	Roanoke County	Rockbridge-Buena Vista-Lexington Area	Russell
Scott	Shenandoah	Shenandoah Valley	Smyth
Southampton	Spotsylvania	Stafford	Suffolk
Surry	Sussex	Tazewell	Virginia Beach
Warren	Washington	Westmoreland	Williamsburg
Winchester	Wise	Wythe	York/Poquoson

29. What other comments do you have?

Appendix C: Informal discussion

The following is drawn from some initial exploratory discussions I had with local CPS staffers. Neither these staffers nor their agencies were included in the survey portion of the research.

Q. Please describe your daily work.

A. Generally my day consists of if I get new reports involving abuses or things like that, we go out and meet with kids at school, we talk to them about home life, how things are going on with them or with their family, we make contact with parents to discuss what the allegation report was. We try to figure out different ways to handle situations, recommend services and ways to keep the family unit intact.

Q. What kind of process about the case do you have?

A. All agencies do it differently. Our agency has all the workers in services unit the CPS, the foster-care, and the APS rotate in-take process. We get reports from people's calls. We get reports from hot line, people sometimes come in, we get letter, and sometimes email. Once information comes to us and goes through CPS supervisor, she determines validity. Once she determines whether or not the case is valid. She assigns it to a worker. There are different ways the cases become. There are four basic things we have to do for a case to be valid. It has to occur in our jurisdiction. That means the abuse has to occur here. If somebody lives here and the abuse occurs in other County, then case would go to that jurisdiction, because that's where it occurred. Abuses actually has to occur in the locality, the child has to be under age 18, and has occurred by somebody who is care takers that has been another adult in household who is responsible for care child, and has to need definition of abuse and neglect in categories; physical abuse or neglected, sexual abuse, emotional abuse which is a little bit more tricky because emotional abuse has to be validated by a license professional. A parent, a teacher, or a police officer and none of those people can make a valid emotional abuse. Case has to be documented by a license professional. Once it's determined if cases meet work criteria and this gradually determined whether or not it is an investigation or an assessment. Investigation is kind of more punitive because the finding of unfounded and founded at the end which goes into a state central registry which prevents people from being a teacher working with kids, running daycare, and working with daycare. Certain social work jobs require CPS background check. And family assessments mainly provide family services. And we offer a plethora of services about everything; substance abuse; parenting; mental health support; just some care-taking skills talking to people about what standards of cleanliness the house needs; getting people and helping people find resources for transportations for food; we can offer counseling services for kids, domestic violence services whether it's for actual victims or for the perpetrators of domestic violence. Actually three investigators can determine whether or not cases can be closed services and service has been successfully offered to the family or sometimes cases have to be open to on-going which means they are determined to be the highest risk for coming into foster care. At that point we provide services to strengthen family and to prevent kid from coming into care.

Q. What is the basis of knowledge to decide if it is going to be investigated or ongoing services?

A. Policies determine that. There are certain things that are required to be investigated. Severe physical abuses, fatality, and sexual abuses are mandated to be investigation things and criminal charges telling drugs, a drug a bust at a house to be investigations. Plus, also mandates that after a certain amount of family assessment in a period of period, three family assessments in a year, the fourth case is mandated to be investigated at that point. Higher levels of abuse or neglect, those things become, a dirty house and environments that are inappropriate can be criminal charges, those things can become investigations. It need determine whether or not assessments and investigation.

Q. Do you have any internal the electronic devices to share kind of information?

A. We have a system as state-wide called OASIS. That is where we input all of information and all state employees who work in CPS and foster care have access to OASIS. We keep all of records cases and all documents in OASIS, essential registry which keep track of all of founded cases in state we also have access to. All of cases of information are entered to OASIS system and then all the cases of information after being entered are kept in OASIS depending on what levels of cases found and what types of cases in the certain periods of time.

Q. Is it helpful to access OASIS to deal with some cases?

A. It's helpful because family has significant history with CPS. We are able to see history. It is not in locality benefits but it's been over a period of years to be helpful. We can go back and read what happens, what the allegation happened in the cases, what services were offered, and what led us to that point. And that way when kids come to the foster care, we can track what their environment has been beginning because OASIS is not only our information in CPS but also information in foster care.

Q. Is there any meeting with co-workers in this County?

A. We meet CPS unit almost weekly to discuss cases. We meet with staff to talk about cases pretty much all the time. We meet as a group this service's unit which would be the CPS, foster care, and APS. We meet about once a month. CPS and foster cases meet our starting to meet a little bit more frequently. Two staff cases in kind of talk about things. We meet at least a unit once a week, as a group of co-workers at least once a month.

Q. Do you work usually independently or together with co-workers?

A. It's typically we work independently. There are times we work together depending on the risk level. There is allegation someone is extremely violent or our concern is somebody is not going to be happy about our presence or it is going to be dangerous environment. Then we typically try to go on pairs because only four of us, five including supervisor is more difficult to do that. We are fortunate we have a good relationship with a law enforcement. Any cases in sexual abuse and severe physical injury automatically work with a law enforcement officer. So, we go out together. But if there somewhere we feel there is a danger is other concerns, or that somebody may become violent, If so, we don't take co-worker rather than law enforcement officers to insure safety.

Q. What do you think information or knowledge sharing help you to deal with cases?

A. We do a lot of meeting with service providers. I think we find incredibly helpful to people who are working with the family. I think the better communication between all the people who are involved the better we are able to serve children. If somebody has a case manager, somebody has a substantive abuse counselor, somebody is working with somebody through the school system, and all of those people can communicate, it would be definitely a lot of easier to provide better services to family to get about understanding what actually is going on. If all the kind of on the same page, we do a lot of communicating with other people who are involved directly in family's life.

Q. In the ongoing services, social worker has to meet children or parents. At that time, what the more benefits do you think to get knowledge from kind of the documents or learning from other social workers' experiences? Which one is better?

A. I think it is easier as far as to begin an ongoing case to talk to get more information from the people who worked with them before. It's much as easier, do I best to do as much as we can with documentation but I think a lot is missed in that. So it's easier and it is better for me to communicate with the other workers to find out information. We can say about family and recidivism as far as we do. I think it is easier sometimes to get a better understanding of the family if we communicate with workers who may have work with them previously. And, just to get about ideas of what has or has not worked may or may not be affective.

Q. Do you have a MOU(memorandum of understanding) with local law enforcement or the other entities?

A. We have a CAT team meaning Child Abuse Team meeting every other month. The commonwealth attorney, the local law enforcement, parent, people from NRB care to teach parenting classes. Sometimes nurses come and people from woman's resources center come. We all meet together. About every other month just talk about issues that we have been experienced and we talk about specific cases that we work together, and different things or issues that we've been having or training. Different things are coming up so everybody is together and communicating and kind of sharing what's going on. So that, we all found that's really helpful.

Q. What kind of measurement of CPS program do you have?

A. There are statistics within this State about the number of cases, investigation, different types of cases, and fatalities. We keep track the amount kids come into kid recidivism. As an agency we track placement with families to prevent kids from coming into care.

Q. what is the difficult to work?

A. I found the most difficult is just takes a while to get people to ask who have substance abuse issues for 20 years and even just to find resources people to be able to get them what they need.

Q. Do you have S.O.P (Standard Operating Procedure)?

A. It is basically that is what policy not only lines out, what child abuse is, but we lines out what we are to do, how we are to handle it and what we are required to do. It is within the same policy.

Q. Is it helpful to deal with cases?

A. I think it is helpful to guide us because nothing that we do is black and white. Everything's different until judgment. Everything is a lot of incredibly different, but I think policy is good and kind of outlines on the basis of what we have to do.

Q. There are a variety of cases. How can you deal with those? S.O.P gives some standardized criteria and guidance. You have to deal with handle those diverse cases differently. How can you deal with those cases?

A. We just have to be creative. There is different those State for structure of decision making which is a standardized system to make decision about case's validity and what steps have to be taken, what different levels of risk are in there. We're all very trained, we are going to different seminars, different training. We never made decision without talking to co-workers and my supervisors. Policy also mandates we stick things to supervisors. We stock a case as a group weekly by weekly, we are together to figure out what is best, within what policy allows because Stat policy mandated, locally administrated. All DSS have ability to do things a little bit differently. There are basic mandates we have to follow.

Q. To be creative for dealing with different cases, when you meet supervisors or co-workers, how those information or knowledge affect you?

A. I've been here three and half year. One of co-workers has been here seven years. We all see different things we see different things of that work, things have works so kind of being willing to try everybody ideas sometimes. My theory is he might have different perspectives on things somebody uses and has been here for seven years. Talk it out and see how it works.

Q. Do you have a formal training?

A. Yes, there are required trainings. There is policy on OASIS training that's a week long there are several sexual abuses investigations, in-take assessment three or four days long, out of family investigation either. Just mandates domestic violence training, substance training we go to there on family engagement training. On top of all of those trainings when responding there we go to conferences, substance abuse, how would work different, different population, sometimes last days at a time. We do lots of trainings throughout it's not something we just do in front something not we continue to do. The entire times were not here. Sometimes we have outside agencies come and talk to us.

Q. Do you think academic degrees are helpful to deal with cases?

A. Within our unit, there are multiple different levels of academic educations and degrees. I have a social work degree Master in social work. I find it incredibly helpful. It is not a mandate. Different levels

of educations shape on knowledge base for what we do. But it is also different backgrounds play well each other.

Q. Is informal communication helpful to handle cases?

A. I think we talk about our cases all the time. It is pretty much continuous. I mean all kind of know what each other is doing. That is not only because we need to know, because sometimes we help each other with cases. Somebody is out of office, there is phone call that way we know each other doing in take ideas about services but it is also a safety issue. We need to know what each other is doing all the time. It is not only it helps us to better serve our clients and to get the safety issues. I don't think as days go by, we don't know each other is doing all day. We talk about it. It is very helpful to deal with cases well.

Q. Do you have any chance to share knowledge with outside entities?

A. We go to the meeting. We have a lot of connections with the community. We also do in services training for day care some assistance different cause and different people who work with kids so that they have a better understanding what we do and what our policy is. Not only do we meet people coming outside community, we go out to the community. About a year go with them to community fair at the mall and we passed out information not leaving your kid in the car.

Q. In some local government social workers are dealing with diverse social works including CPS. Is it true?

A. Sometimes, agencies are small, medium, and large. Small agencies serve small population which had generic workers. Generic workers do foster care, APS, CPS and do some eligibility things. Depending on the size, the bigger agencies, the more precise what worker does. Small agencies typically do have generic workers. They do a little bit about everything because they serve as more case loads they have. Median size agencies typically do as they do. The bigger agencies have prevention workers, on-going workers, and domestic violence workers. They have more specific case loads. It depends on the size of localities.

Appendix D: Correlations of Included Variables

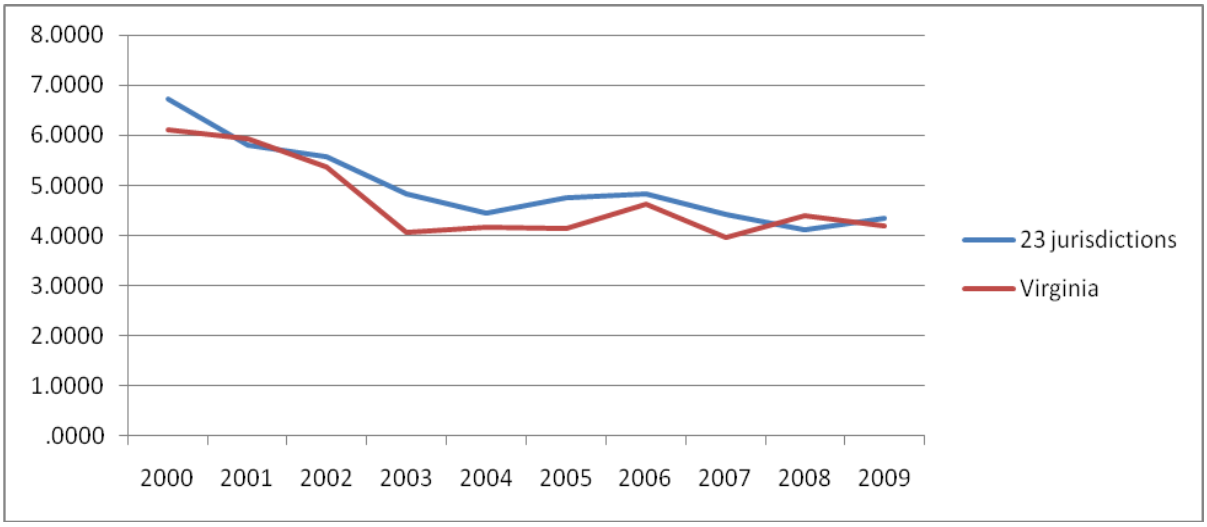
	CHI	CUR	CPE	CFA	TS	DE	FT	PM	RT	TEKS	TTKS	UEKS	UTKS	AEKS	ATKS	CANR	CFCR
CHI	1																
CUR	-.373***	1															
CPE	-.011	-.066	1														
CFA	.043	-.400***	-.426***	1													
TS	.220**	-.082	-.051	.061	1												
DE	.135	-.176*	.110	.167*	.037	1											
FT	.108	-.192**	.070	.106	.484***	.036	1										
PM	-.002	-.042	.063	.137	.265***	-.053	.136	1									
RT	-.101	.034	.065	-.079	-.136	.070	-.182*	-.064	1								
TEKS	-.064	-.063	-.065	-.018	-.022	.039	.135	-.057	-.032	1							
TTKS	.044	-.047	-.077	.074	.184**	.013	.155*	.190**	-.193**	.234**	1						
UEKS	-.106	.148	.104	-.078	-.055	-.130	-.012	.081	-.198**	.127	.048	1					
UTKS	.073	.038	-.014	.123	.020	-.079	.045	.326***	.001	-.127	.219**	.397***	1				
AEKS	.210**	.007	-.102	.082	.089	.002	.044	.088	-.109	-.025	-.037	.262***	.404***	1			
ATKS	.119	.021	-.132	.047	.055	-.090	.139	.150	-.152	-.066	.142	.315***	.677***	.516***	1		
CANR	.268***	.032	-.206**	.064	-.060	.091	-.138	.111	.044	.078	-.035	-.227**	-.011	-.005	-.007	1	
CFCR	-.152	-.045	.136	.277***	.067	-.091	.041	.020	-.060	-.048	.143	.068	.002	-.033	-.135	-.592***	1

Note 1: CHI (Changes in median household income), CUR (Changes in unemployment rate), CPE (Changes in CPS program expenditures), CFA (Changes in family assessments), TS (Tenure as a CPS staffer), DE (Degree of

education), FT (Frequency of CPS work training), PM (Personal motivation), RT (Red tape), TEKS (Time of explicit knowledge sharing), TTKS (Time of tacit knowledge sharing), UEKS (Usefulness of explicit knowledge sharing), UTKS (Usefulness of tacit knowledge sharing), AEKS (Access to explicit knowledge sharing), ATKS (Access to tacit knowledge sharing), CANR (Changes in child abuse or neglect rates), CFCR (Changes in foster care rates)

Note 2: significance level: *p< .10, **p< .05, ***p< .01 (two-tailed tests).

Appendix E: Child Abuse or Neglect Rates, 2000-2009



Child abuse or neglect rates (Virginia, 2000-2009)

Source: Virginia Department of Social Services (VDSS)

Appendix F: Survey Respondents: Descriptive Statistics

Sex	Frequency	Percent
Female	99	85.3
Male	17	14.7
Total	116	100.0

Education	Frequency	Percent
2 year college degree	1	.9
4 year college degree	71	61.2
Master's degree	43	37.1
Total	115	99.1
Missing	1	.9
Total	116	100.0

Worktype	Frequency	Percent
Intake	11	9.5
Investigation	24	20.7
Family assessment	38	32.8
On-going services	19	16.4
Supervision	19	16.4
Total	111	95.7
Missing	5	4.3
Total	116	100.0

Source: Returned surveys

Survey Response Rate by Local Jurisdiction

Locality	Number of Potential Respondents	Number of Respondents	Percent (%)
Albemarle County	9	5	55.6
Alexandria City	21	6	28.6
Campbell County	9	6	66.7
Charlottesville City	6	4	66.7
Chesapeake City	25	5	20.0
Danville City	8	6	75.0
Hampton City	7	2	28.6
Henrico County	12	9	75.0
Henry/Martinsville County	6	6	100.0
James City County	7	4	57.1
Lynchburg City	9	8	88.9
Newport News City	15	12	80.0
Norfolk City	5	3	60.0
Portsmouth City	21	3	14.3
Prince William County	20	5	25.0
Richmond City	25	6	24.0
Roanoke County/Salem City	13	10	76.9
Spotsylvania County	8	3	37.5
Stafford County	7	1	14.3
Suffolk City	5	3	60.0
Tazewell County	5	1	20.0
Wise County	10	4	40.0
York County/Poquoson City	5	2	40.0
Missing		2	
Total	258	116	45.0

Appendix G: Discriminant validity measures

Construct	Constrained Model		Unconstrained model		$\Delta\chi^2$	Δdf	P-value
	χ^2	df	χ^2	df			
PM-UEKS	58.24	20	18.26	19	39.89	1	P<0.01
PM-UTKS	68.74	20	38.94	19	29.80	1	P<0.01
PM-RT	116.92	44	69.29	43	47.63	1	P<0.01
RT-UEKS	86.33	14	31.00	13	55.33	1	P<0.01
RT-UTKS	57.47	14	23.39	13	34.08	1	P<0.01
UEKS-UTKS	16.99	2	0.19	1	16.80	1	P<0.01

Note: PM (Personal motivation), RT (Red tape), UEKS (Usefulness of explicit knowledge sharing), UTKS (Usefulness of tacit knowledge sharing)

Appendix H: Goodness of fit measures: Path Models

Goodness of fit statistics	
Absolute fit measures	
Chi-square (χ^2)	66.37 (df=22, p=0.00)
Goodness of fit index (GFI)	0.91
Root mean square error of approximation (RMSEA)	0.13
Incremental fit measures	
Incremental fit index (IFI)	0.81
Normed fit index (NFI)	0.74
Comparative fit index (CFI)	0.79
Parsimonious fit measures	
Adjusted goodness of fit index (AGFI)	0.76
Parsimonious normed fit index (PNFI)	0.36
Parsimonious goodness of fit index (PGFI)	0.36

H-1: Goodness-of-fit indices for knowledge sharing, personal motivation, red tape, CPS program performance

Goodness of fit statistics	
Absolute fit measures	
Chi-square (χ^2)	260.013 (df=99, p=0.00)
Goodness of fit index (GFI)	0.80
Root mean square error of approximation (RMSEA)	0.12
Incremental fit measures	
Incremental fit index (IFI)	0.61
Normed fit index (NFI)	0.49
Comparative fit index (CFI)	0.57
Parsimonious fit measures	
Adjusted goodness of fit index (AGFI)	0.70
Parsimonious normed fit index (PNFI)	0.36
Parsimonious goodness of fit index (PGFI)	0.52

H-2: Goodness-of-fit indices for the full model