A STUDY OF COMMUNITY PHARMACY PRACTICE SITES: TIME, MANAGEMENT AND PATIENT CARE ACTIVITIES

by

Mary Kathleen Gurney

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MARY KATHLEEN GURNEY

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****

Approval Signatures of Dissertation Committee

Jeanne Mount

Betty Chewning

James A. Aldag

James M. Mordberg

Bonnie Dahlstrom

Signature, Dean of Graduate School

Committee's Page. This page is not to be hand-written except for the signatures

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and renew a steadfast spirit within me.
Do not cast me from your presence
or take your Holy Spirit from me.
Restore to me the joy of your salvation
and grant me a willing spirit, to sustain me.

Psalm 51:10-12 (NIV)

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ABSTRACT

The development and implementation of drug therapy management services represents a significant change in how the pharmacy profession views its role in the provision of patient care. Drug therapy management is a patient-focused, relationship-based model of pharmacy practice. Provision of drug therapy management services requires pharmacists and pharmacies to develop a future time perspective regarding the management of the pharmacy and the management of the patient. Organizational research has focused on how future time perspective, as an element an organization's culture, e.g., belief structures, influences the organization's ability to adopt new ideas. Traditionally, organizational culture and its impact on adoption of new ideas has not been the focus of much of the pharmacy literature. In this study, we examine the relationships between future time perspective, strategic management, operational management and drug therapy management at the pharmacy site.

Data were collected via key informant interviews and pharmacist staff surveys in one Midwestern State. Of 50 participating pharmacies, 39(78%) were included in data analysis. Of 118 eligible staff in these pharmacies, 82 (69%) were included in data analysis. Pharmacies are the unit of analysis; all variables were aggregated to create organizational-level variables. Four control variables, prescription workload, pharmacist intensity, independent ownership and corporate-chain ownership were included.

The more future-oriented a pharmacy is in strategic management, the more future-oriented a pharmacy will be in operational management. In turn, the more future-oriented a pharmacy is in operational management, the more future-oriented the pharmacy is in performing drug therapy management.

Findings suggest that future-oriented management of the pharmacy itself is positively related to the provision of drug therapy management services. Pharmacists and pharmacies wishing to provide drug therapy management to their patients might better succeed if they consciously manage the pharmacy for the provision of this model of practice.

CHAPTER 1: INTRODUCTION

Pharmacists constitute one of several professions that share responsibility within the health care delivery system for a patient's drug therapy management. The Academy of Managed Care Pharmacy (AMCP) defines drug therapy management as "that component of the health care system that seeks, through the caring, collaborative efforts of a team of pharmacists, physicians, nurses and other health care practitioners, to ensure that medications are used appropriately to improve patient health status" (Academy of Managed Care Pharmacy, 2002:1). Pharmacists as the primary dispensers of prescription medications and with their expert knowledge of medications, including effects, side effects, uses and drug interactions play an important role in this collaborative effort.

Pharmacy has been influenced by major changes in health care delivery in the United States. Pharmacists' roles and responsibilities within the health care delivery system have changed over the course of the past century due to changes in pharmaceutical technology, health care reimbursement, and the complexity of medication regimens.

In the 1980s, institution of cost-containment measures (e.g., diagnosis-related groups in the Medicare payment system, utilization management, drug formulary management) resulted in shorter hospital stays and more patients being treated outside of hospital settings (Higby, 1997a). As a consequence, the number of prescriptions filled in community-based pharmacies (i.e., out-patient, ambulatory based pharmacies) is expected to increase from 3.01 billion in 2001 to 4.00 billion in 2005 (National Association of Chain Drug Stores, 2003b). The cost of medication-related morbidity and mortality in the United States has been estimated at $76.6 billion per year (Johnson & Bootman, 1995) . Thus, while

prescription dispensing remains a vital function of community-based pharmacies and pharmacists, drug therapy management is an increasingly important function that can be performed by pharmacists to help patients avoid negative health outcomes and maximize positive health outcomes (Academy of Managed Care Pharmacy, 2002; Johnson & Bootman, 1995).

In the 1940s and 1950s, development of prefabricated medications standardized the delivery of medications and prescription volume increased dramatically (Higby, 1997a, 1997b, 2002a). Increasing prescription volumes forced the pharmacist to focus predominately on getting the right medication to the right patient and ushered in an era of "count and pour, lick and stick" pharmacy practice (Hepler, 1987; Mrtek, 1976). At this same time, the American Pharmaceutical Association (APhA) 1952 Code of Ethics prohibited pharmacists from talking with a patient about their medications (Buerki & Vottero, 2002). The 1960s saw the birth of the clinical pharmacy movement, which moved the pharmacists role from one of "drug dispenser" to "drug expert" (Adamcik, Ransford, Oppenheimer, Brown, Eagan, & et al., 1986; Birenbaum, 1982; Broadhead & Facchinetti, 1985; Cotter, Barber, & McKee, 1994). During this time, clinical pharmacy changed pharmacy's perspective from the wants of the customer to the needs of the patient (Higby, 2002b). This change in perspective was reflected in the revised Code of Ethics adopted by APhA, which now promotes pharmacists talking with their patients about their medications (Buerki & Vottero, 2002)

The late 1980s and early 1990s saw the next significant changes to the roles and responsibilities of pharmacists and the profession with the birth of pharmaceutical care and its focus on relationship-based patient care (Cipolle, Strand, & Morley, 1998; 2003; Hepler & Strand, 1990). The philosophy of practice embodied by pharmaceutical care and its later

counterparts, including drug therapy management, have attempted to focus pharmacists' attention on caring for individual patients on a long-term basis within their pharmacy practices. Thus, "effective drug therapy management is necessarily oriented to a continuous, longitudinal care management plan rather than episodic encounters with patients seeking one or more prescription drugs" (Academy of Managed Care Pharmacy, 2002:4). The intent of this new philosophy of pharmacy practice is to move pharmacy from a product-focused, transaction-based practice to one that is patient-focused and relationship-based (Academy of Managed Care Pharmacy, 2002; Cipolle, Strand, & Morley, 1998, 2003).

The changes required by this new philosophy of practice can be illustrated by examining the biographical interest typology developed by Lefton and Rosengren (1966). There are two dimensions to the biographical interest typology, biographical space and biographical time. Biographical space corresponds to the breadth of interest in the patient; that is, the focus on the patient is either narrow or broad. In pharmacy practice, pharmacists may have a narrow interest in patients requiring acute medication therapies (e.g., antibiotics, cold medications) on an infrequent basis. In contrast, pharmacists may take a broader interest in patients with several co-morbidities (diseases) who are taking several medications and require more care from the pharmacist. Biographical time, on the other hand, corresponds to the span of time that is thought about in caring for the patient (Lefton & Rosengren, 1966), be it short or long. Continuous, longitudinal care requires that a longer span of time be taken into account in the provision of pharmacy services to a patient, whereas episodic encounters require a briefer span of time. Thus, performance of drug therapy management with its focus on continuous, longitudinal patient care requires changes in both biographical space (i.e., breadth of interest) and biographical time (i.e., span of time) by both

individuals and pharmacies. An ability to take a more future-oriented time perspective seems necessary if pharmacists and pharmacies are going to successfully provide drug therapy management services to their patients.

PERSPECTIVES ON TIME

Provision of drug therapy management services suggests that pharmacies and pharmacists need a new perspective on "time." In the management and pharmacy literature, time is most commonly viewed as a resource, something of value due to its finite nature. Time therefore is treated as a resource to be used effectively and efficiently. In pharmacy, this approach is reflected, for example, in time and motion studies that evaluate how pharmacists spend their time (Arthur Anderson, 1999; Nickman, Guerrero, Bair, & Nielsen, 1989; Schneider & Nickman, 1998), evaluation of automated medication dispensing systems (Durley, Fruin, Witte, Higazy, & Hyziak, 1994; Imperiali, Clapp, & Santoro, 1996), and analysis of time requirements for patient counseling (Oh, McCombs, Cheng, & Johnson, 2002) to identify ways to find time for pharmacists to perform drug therapy management activities.

Yet, Rascati and colleagues (1987) found that after implementation of a new computer system, pharmacists did not spend any more time performing activities related to drug therapy management. Why was there no change in pharmacists' behaviors after the introduction of technology that was intended to give them more time to perform patient care activities? An explanation may lie in a different conceptualization of time.

In the management and sociology literature, time is viewed not only as a resource, it is also viewed as an element of organizational culture (Bluedorn, 2000; 2002a; Schein, 1985;

1992). Organizational culture is defined as a system of shared meanings, assumptions and underlying value (Morgan, 1986; Schein, 1985,1992; Smircich, 1985). In an interview, (Bluedorn & Hall, 1998), Hall describes time as being fundamental to human existence because "...everything in life occurs in a time frame – most of which is taken for granted." Thus, perspectives about time may influence the behaviors and activities of organizations and their members.

Research conducted in the past two decades has shown that organizations have a broad range of perspectives regarding time. Researchers have examined several different questions related to an organization's perspective of time including: Does the organization have a past, present or future orientation? Are organizations monochronic (i.e., focused on one project at a time) or polychromic (i.e., juggling several projects at a time)? Is time perspective more important for organizations in dynamic industries?

Several researchers have found that future time perspective, as an element of organizational culture, influences the actions and decisions of members of an organization (Das, 1986; El Sawy, 1983; Schriber & Gutek, 1987). Therefore, if time perspective influences the decisions and actions of an organization and its members, it is important to examine the organization's time culture and the actions of members of the organization related to management of the pharmacy site and management of patients' drug therapy.

MANAGEMENT ACTIVITIES

Two core functions within community pharmacy practice are management of the pharmacy site and management of patients' drug therapy. Recent studies in the pharmacy literature have focused on the necessity of managing the pharmacy to provide the

environment necessary for the provision of drug therapy management (Cipolle, Strand, & Morley, 1998, 2003; Hagel & Rovers, 2002). Doucette and Koch (2000) found that the "futurity of decisions" strategic decisions made by a pharmacy helped determine if the pharmacy changed to a patient focused model of practice. Therefore, if a future time perspective is necessary for adoption of drug therapy management and management of the site is necessary for the provision of drug therapy management, it is important to examine the relationship between the organization's future time perspective, site management activities and drug therapy management activities.

The business literature consistently identifies four management activities that are necessary for the success of an organization: planning, organizing, implementing and controlling (Daft, Fitzgerald, & Rock, 1992; Fayol, 1949; Mintzberg, 1980). These four activities can be divided into strategic and operational management. Planning is the core activity related to strategic management. Operational management is comprised of organizing, implementing and controlling and is focused on day-to-day activities of the pharmacy. Decisions made regarding strategic and operational management activities reflect the time perspective of the pharmacy. If an organization has not done any planning and operational management is focused only on the immediate day-to-day activities, the time perspective of this organization is shorter. In contrast, an organization that has created a plan to provide a framework for operational management activities has a culture of time focused further into the future.

Not only do strategic and operational management activities have a time perspective embedded within them, so to do drug therapy management activities. As mentioned previously, if future time perspective influences management activities then it may influence

drug therapy management activities. Episodic patient care requires a shorter span of time for pharmacist involvement in a patient's care. In contrast, pharmacies and pharmacists performing drug therapy management use a longer time frame when providing care to a patient. This reflects the continuous, longitudinal character of drug therapy management for patients with chronic conditions.

PURPOSE AND AIMS OF THE STUDY

Change from an episodic, transaction-based model of patient care to relationship-based drug therapy management requires a change in time perspective of pharmacists and pharmacies. In this context, time is examined as an element of organizational culture. The main purpose of this study is to measure and analyze the relationships between future time perspective, strategic management, operational management, and drug therapy management activities within community pharmacies. There are three aims of this study. The first is to describe the future time perspective, management activities (strategic, operational, and drug therapy) of individual pharmacists and pharmacies. The second aim of the study is to examine the relationships between future time perspective and strategic, operational and drug therapy management activities to determine whether future time perspective influences management activities. The third aim of the study is to examine the relationships between strategic management, operational management and drug therapy management.

CHAPTER PREVIEW

Chapter 2 presents the theoretical basis for the research, reviewing relevant literature related to time, culture, management, and drug therapy management activities. Chapter 3 outlines the methods used in sample selection and data collection. Chapter 4 presents

measures and data analysis. Chapter 5 presents descriptive results related to time, strategic management, operational management, and drug therapy management. Chapter 6 is the presentation of the analytic results examining the relationships between the constructs. Finally, Chapter 7 discusses the study findings, describes limitations, and draws conclusions and implications of the findings with suggestions for further research.

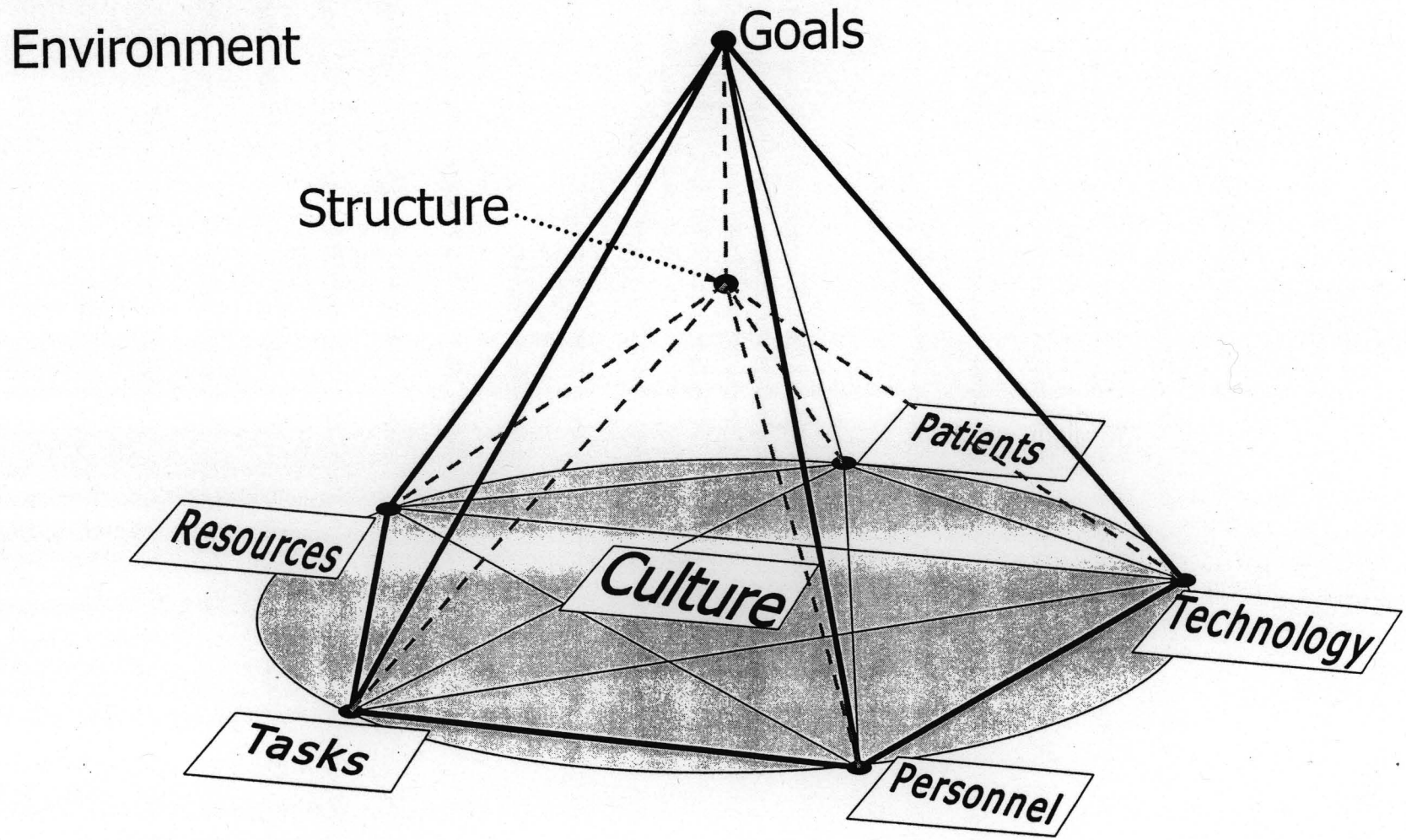
CHAPTER 2: LITERATURE REVIEW

The guiding framework for this discussion of future time perspective and its relationship with strategic, operational and drug therapy management is the Organizational Pyramid developed by Høst (1997) and adapted by Mount (2002, see Figure 2-1).[1] The Organizational Pyramid brings together in a single framework the elements of an organization that are necessary for continued existence and depicts the interconnections between the various elements. In the Pyramid, all of the elements are linked to one another. Thus, changing one element has effects on other elements (Mount, 2002). Drug therapy management is a change in the philosophy of pharmacy practice and slowly is becoming a goal of organizations involved in community pharmacy practice. The process of drug therapy management requires that changes occur within elements in the Pyramid. As changes occur in one element, changes will occur in other elements.

This review is limited to several key elements of the framework: organizational culture (including future time perspective as an element of organizational culture), goals, personnel, resources, and tasks as related to strategic, operational, and drug therapy management. This is not to imply that other elements are unimportant, but rather that they are not as applicable to the present study. Because the primary focus of this discussion is the relationship between future time perspective as a part of organizational culture and strategic, operational, and drug therapy management activities, I first will discuss and define organizational culture. Next I will discuss several perspectives on time. This will be

[1] As originally presented, the Pyramid identified eight key elements. To capture more fully the situation of contemporary health care, a ninth element ("patient") has been added (Mount 2002:75).

Figure 2-1: Organizational Pyramid



(Host 1997; adapted by Mount 2002:75)

followed by discussion of management activities and community pharmacy practice. I will conclude with the research aims and hypotheses of this study.

ORGANIZATIONAL CULTURE

Organizations require a framework within which to function to achieve the purpose and goals of the organization. Organizational culture is one of the nine elements identified in the Organizational Pyramid (Høst, 1997; Mount, 2002). Before proceeding, it is important to provide a general definition of culture. Culture has several definitions in the Merriam-Webster Dictionary (2003). Three related definitions are relevant to the discussion of organizational culture:

> a) the integrated pattern of human knowledge, belief and behavior that depends upon man's capacity for learning and transmitting knowledge to succeeding generations; b) the customary beliefs, social forms and material traits of racial, religious or social groups; and c) the set of shared attitudes, values and practices that characterize a company or corporation (Merriam-Webster Online Dictionary, 2003 s.v. "culture")

These three definitions show that culture is characterized by patterns of beliefs and behaviors that define a social group, a company, or an organization.

Just as there are multiple definitions of culture, so to are there multiple definitions of organizational culture. Martin (2002:56) identifies twelve definitions of organizational culture that reflect the range of definitions used among organizational culture researchers. Martin cites definitions from the following authors: Davis (1984), Louis (1985), Martin (2002), Meyerson (1991a), Mills (1988), Sathe (1985), Schall (1983), and Sergiovanni and Corbally (1984). These definitions vary based on three characteristics: (1) ideational and materialistic approaches, where ideation emphasizes subjective interpretations and the materialistic approach focuses on material well-being (e.g., conditions of work, size of

paycheck); (2) focus and breadth, that is "generalist" versus "specialist" conceptions of culture; and (3) level of depth of interpretations, as exemplified by Schein's (1985; 1992) three levels of depth, artifacts, values and basic assumptions (Martin, 2002). At the core of these definitions, though, organizational culture is a system of shared meanings, assumptions and underlying values (Davis, 1984; Martin, 2002; Morgan, 1986; Schall, 1983; Schein, 1985; Smircich, 1985). Stated another way, an organization's culture reflects how its members view the world and its location in the world. Not all organizations have a single unified culture. While all members of an organization may not embrace a single culture (Martin, 1992; Meyerson & Martin, 1987), these difference and similarities in cultural beliefs influence the actions that members of an organization might or might not take.

Trice and Beyer (1993) elaborate the definition of organizational culture into two components: (1) *cultural substance*, which consists of shared systems of beliefs, values and norms; and (2) *cultural forms*, which are observable ways that members of a culture express cultural substance. Trice and Beyer discuss these shared systems of beliefs, values and norms as *ideologies.* Schein (1985; 1992) identifies these unconscious, taken-for-granted beliefs, perceptions, thoughts and feelings an the *basic underlying assumptions*, the ultimate source of values and actions in the organization . These shared beliefs, values and norms reflect the culture(s) of the organization. That is, the organization may have an overarching culture,[2] yet subcultures may exist within this more global culture (Martin, 1992,2002; Meyerson & Martin, 1987; Morgan, 1986). This follows a similar pattern to what is seen in society. For example, while something viewed as a general culture of the United States exists, there also are identifiable subcultures including those based on ethnicity, religion, age, etc.

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[2] The terms ideology and culture are used interchangeably in this section, as defined by Trice and Beyer (1993).

From where do these ideologies come? Ideologies can enter an organization from various sources. Trice and Beyer (1993:46) identify six "extraorganizational sources of ideologies: transnational cultures, national cultures, regional and community cultures, industry cultures, occupational cultures and other organizations' cultures." Because the focus of this study is on culture in community pharmacies in the United States, the remaining discussion of organizational culture will focus on the influence of industry and occupational cultures. The other sources of ideologies, i.e., transnational, national, regional and community cultures, are less relevant to this study as all of the organizations are based in and owned by companies in the United States.

Culture of an Industry

As defined previously, cultural substance is the ideologies that exist within a group, organization, industry, etc. Different industrial sectors (i.e., health care, manufacturing, telecommunications) may be exposed to unique activities and problems which then give rise to ideologies that are specific to that industry (Trice & Beyer, 1993) The culture can be influenced by the level of competitiveness, historical developments, dominant technologies, and the customers' (or in pharmacy's case, patients') requirements (Gordon, 1991). These influences affect the beliefs and values of members working within an industry. For example,

> ...no matter when or by whom an electric utility is founded, a widely shared assumption is that the customer needs continuous, uninterrupted service. Based on this assumption, a high value is placed on reliable delivery of the product, which manifests itself in forms designed to avoid either strategic or operational decisions that involve radical departures from known ways of doing things. Thus the industry predisposes all the companies within it to develop cultures that encompass certain assumptions and values stemming from the nature of what the industry does or produces (Gordon, 1991: 402).

This results in organizations within an industry developing shared beliefs about appropriate strategies (Huff, 1982; Whipp, Rosenfeld, & Pettigrew, 1989). A culture of the pharmaceutical industry can also be identified. The beliefs and values of the pharmaceutical industry are built upon the ability of companies to innovate in three areas, process innovation, product innovation and organizational innovation to increase profitability (Belcher & Nail, 2000). Pharmacies and pharmacists are focused on the provision of prescription medications and the appropriate use of these medications by patients (Academy of Managed Care Pharmacy, 2002). Yet, within the context of prescription medication provision, Zellmer (2002) discusses several subcultures within pharmacy practice that are related to specific sectors of practice. Zellmer (2002: 4) identifies six subcultures within pharmacy practice: the dispenser-communicator, the dispenser, the clinician, the manager-leader, manager-administrator, and the entrepreneur (see Table 2-1). Each of these groups of pharmacists and the pharmacies that they work within has a set of characteristic "customs, beliefs, ways of behaving, and values" that distinguishes it from other groups or subcultures (Zellmer, 2002: 4).

There are over 22 national pharmacy associations in the United States (Anonymous, 2003). The National Association of Chain Drug Stores (NACDS), the National Community Pharmacists Association (NCPA), the Academy of Managed Care Pharmacy (AMCP) and the American Society of Health-Systems Pharmacists (ASHP) are the four primary industry-specific associations in the United States. NACDS serves as the voice for nearly 200 chain

Table 2-1: Subcultures of Pharmacy Practice

Subculture	Definition
The dispenser-communicator	Pharmacists who combine prescription dispensing or medication distribution functions with information-related activities such as patient counseling or prescriber consultation.
The dispenser	Pharmacists who concentrate on dispensing prescriptions or filling medication orders.
The clinician	Pharmacists with a solid knowledge base in therapeutics, sometimes in a highly specialized area, who concentrate on applying that knowledge in patient care, education, or research.
The manager-leader	Pharmacists who use their positions of authority to advance the status of pharmacy in their practice settings.
The manager-administrator	Pharmacists in positions of authority who place far more emphasis on efficiency and productivity than on professional leadership.
The entrepreneur	Pharmacists in the business of providing pharmacy-related services to a paying clientele, including pharmacist owner-operators of independent community pharmacies, home infusion therapy services, and a growing array of other services.

Zellmer (2002:4)

pharmacy corporations in Washington, D.C., state capitals and across the nation (National Association of Chain Drug Stores, 2003a,2003b).[3] Where NACDS represents chain pharmacy organizations, NCPA represents the professional and proprietary interest of pharmacy owners, managers and employees in approximately 25,000 independently-owned community pharmacies (National Community Pharmacists Association, 2003).[4] In contrast, AMCP (2003) states that their "sole purpose is to represent the views and interest of managed care pharmacy." Lastly, ASHP (2003) represents pharmacists who practice in hospitals, health maintenance organizations, long-term care facilities, home care, and other components of organized health care systems. Each of these associations has a specific focus regarding pharmacy practice which is based on the membership of that association. NACDS and NCPA both predominantly represent *owners*, be that a corporation or a single proprietor. In contrast, AMCP represents individual pharmacists and non-pharmacists who support the goals and missions of managed care pharmacy and ASHP represents individual pharmacists working in health-system based pharmacy practices. This difference in representation perspective is seen in the vision and/or mission statements of the four associations. The language used by NACDS and NCPA reflects an "industry" focus. By that I mean the focus is on serving chain pharmacy corporations and small business owners as business entities. In contrast, the language utilized by AMCP and ASHP focuses on serving pharmacists in specific practice settings to help them provide patient care. Thus, associations set the

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[3] According to NACDS, the chain community pharmacy industry is comprised of approximately 20,3000 traditional chain drug stores, 8,300 supermarket pharmacies, and 5,500 mass merchant pharmacies. Chain-operated retail pharmacies fill over 70% of the 3 billion prescriptions dispensed annually in the United States.

[4] According to NCPA, independent community pharmacies dispense the majority of the nation's prescriptions. Note that this is in conflict with the figures cited by NACDS. One possible reason for the discrepancy is that small chain pharmacies may belong to both groups, resulting in their prescription volume being counted by both organizations.

standards for organizations and individuals involved in specific segments of pharmacy practice. Industry culture is only one method by which ideologies can enter an organization.

Culture of an Occupation

Ideologies may also enter an organization via an occupation's or profession's culture. Members of various occupations and professions bring to organizations the ideologies that they acquired through learning their trade or profession (Morgan, 1986). During the process of learning their trade or profession, members are "inevitably indoctrinated with beliefs, values and norms specific to that occupation" (Trice & Beyer, 1993: 53). These beliefs, values and norms are exemplified in the curriculum of the training institutions and the code of ethics of a profession.

Over the past century, ideologies of the profession of pharmacy have changed; the professional education of pharmacists also has changed to promote these new ideologies. At the turn of the century pharmacists were trained through an apprenticeship program (Beavers, 1996; Higby, 1997a,; 1997b). The United States War department refusal to commission pharmacists during World War I (WWI) and World War II (WWII) led to changes in the curriculum and professional education of pharmacists (Higby, 1997a, ; 1997b). After WWI, the minimum requirement for graduation was the four-year Bachelor's of Science degree. After WWII, the pharmacy profession re-examined all aspects of pharmacy through a major self-study called the Pharmaceutical Survey (Elliott, 1950; Higby, 1997b). The state of pharmacy education at this time was found to be far behind the times in the face of the changing U.S. health care system (Higby, 1997b). The committee recommended the adoption of a standard six-year Doctor of Pharmacy curriculum to make pharmacy a true profession (Higby, 1997b). There was much debate concerning the recommendation; the

chain drug industry and independent pharmacy owners wanted to retain the four-year standard while educators and pharmacy leaders favored the six-year program (Higby, 1997b). A compromise was reached and the five-year BS program became the standard of professional pharmacy education in the U.S. in 1960 (Higby, 1997b).

As professional pharmacy education was being pushed to change in the 1950s due to changes in the U.S. health care system, the professional code of ethics for pharmacy, adopted by the American Pharmaceutical Association (as of 2003 the American Pharmacists Association reflected a different perspective on pharmacy practice. The 1952 Code of Ethics recognized a limited role for pharmacists:

> The pharmacist does not discuss the therapeutic effect or composition of a prescription with a patient. When such questions are asked, he suggests that the qualified practitioner is the proper person with whom such matters should be discussed (Buerki & Vottero, 2002: 199).

This effectively limited pharmacists' ability to discuss with patients the medications they were receiving.

In the 1970s, the pharmacy curriculum changed due to pressure from the American Council on Pharmaceutical Education (ACPE), the national agency that set and enforces standards for accreditation of professional degree programs in colleges and schools of pharmacy (American Council on Pharmaceutical Education, 2003; Higby, 1997b,2002a). ACPE wanted pharmacy education to place greater emphasis on four components of clinical pharmacy: collection of patient information, prospective drug utilization review, patient counseling, and prescriber consultation (Beavers, 1996).

This change in educational requirements reflected the advances introduced by the clinical pharmacy movement in the 1960s. The clinical pharmacy movement began to alter

the professional roles and responsibilities of pharmacists by redefining the role of the pharmacist from the distributive functions of a "drug dispenser" to the provision of information and advice as a "drug expert" (Adamcik, Ransford, Oppenheimer et al., 1986; Albrant, Maine, & Penna, 2003; Birenbaum, 1982; Broadhead & Facchinetti, 1985; Cotter, Barber, & McKee, 1994). In community pharmacy practice, activities related to clinical pharmacy included adherence monitoring, identifying adverse drug reactions, drug utilization review, and provision of information to patients (Higby, 2002b; White, 1978). These changes were reflected in 1969 APhA Code of Ethics which states:

> A pharmacist should hold the health and safety of *patients* to be of first consideration; he should render to each patient the full measure of his ability as an essential health practitioner (Buerki & Vottero, 2002: 202, emphasis added)

That is, pharmacists were now explicitly instructed to care for needs of the patient, not the wants of the customer (Higby, 2002b; White, 1978).

In 1989, ACPE again began to press colleges and schools of pharmacy to revise their curricula. Curriculum changes were two-fold: the length of the professional program increased from the five-year BS degree to the six-year Doctor of Pharmacy degree and a greater emphasis was placed on drug therapy management (Nona & Wadelin, 1990). Changes in professional education adopted by ACPE reflected the *Pharmacy in the 21st Century Conferences*, a series of profession-wide strategic planning sessions focused on identifying and prioritizing the major issues confronting pharmacy in the next 15 to 20 years (Albrant, Maine, & Penna, 2003; Kwong, 2003). Participants at the sessions identified the need to develop standards for pharmaceutical care as a key to the profession's future. The focus of pharmaceutical care was the pharmacist's responsibility to the patient in achieving

appropriate drug use. This change in ideology again was reflected in changes made to the APhA Code of Ethics. The 1994 revision focused on the relationship between a pharmacist and his/her patient and the responsibilities entailed by that relationship (Buerki & Vottero, 2002).

Members of a profession are socialized to the profession's norms, values and beliefs through several mechanisms including formalized education, training, work environment, and associations. In the profession of pharmacy, formalized education socializes students by teaching them the professional role of pharmacists and the expectations related to the performance of that role (Chalmers, Adler, Haddad, Hoffman, Woodward, & et al., 1995). After completion of formal education, socialization continues when pharmacists (and other professionals) begin practicing in the "real" world. Therefore, once members of an occupation or profession are educated and join a work organization, they bring with them the beliefs, values and norms that are specific to that profession. As a result of these changes, pharmacists educated during specific eras were socialized to a specific set of beliefs, norms and values.

Pharmacists and pharmacy students learn professional norms, values and beliefs from various sources including formalized education and their work environment. Formalized education lays the foundation for the occupation's norms, values and beliefs. Next, when pharmacy students and pharmacists go to work in pharmacy organizations, they are socialized to the norms, values and beliefs that guide the sector of the industry in which their pharmacy organization resides. For example, community pharmacies, in-patient hospital pharmacies and long-term care pharmacies are different segments of the pharmacy industry that differ in the populations they serve and goals related to provision of services to those

populations. Thus, pharmacists and pharmacy students carry into a work organization the values of the profession and, upon entering the work organization, learn the values, norms and beliefs of the organization.

Cultural Forms

Cultural forms are observable expressions of the beliefs, values and norms held by members of that culture. Trice and Beyer (1993) identify four conceptual categories of cultural forms: symbols, language, narratives, and practices (see Table 2-2). Morgan (1986), on the other hand, identifies the organization's structure, rules, policies, goals, missions, job descriptions and standard operating procedures as providing an interpretive function "as one of the primary points of reference for the way people think about and make sense of the contexts in which they work" (p. 132). Simply put, these concrete examples reflect the values and norms of the organization. It is possible to fit these concrete examples of cultural forms into the four conceptual categories identified by Trice and Beyer. For example, the written policies, goals and missions of an organization might be classified as language, that is, words used to project the cultural image of the organization.

Though there are multiple definitions of organizational culture, many organizational culture researchers define "culture in approximately the same way – in terms of cultural manifestations that are shared by most cultural members" (Martin, 2002: 91). Just as researchers have slightly different definitions of culture, they also use a variety of methods to obtain evidence of an organization's culture. The identification of cultural forms is one way researchers gain evidence of an organization's culture. Schein (1985; 1999) would argue that cultural forms are only superficial representations of an organization's culture and do not address the underlying meanings that are attributed to those artifacts. Nonetheless, Martin

Table 2-2: Categories and Examples of Cultural Forms

Category	Examples
Symbols	Objects, Natural and manufactured Settings Performers, functionaries
Language	Jargon, slang Gestures, signals, signs Songs Humor, jokes, gossip, rumors Metaphors Proverbs, slogans
Narratives	Stories, legends Sagas Myths
Practices	Rituals, taboos Rites, ceremonials

Trice and Beyer (1993:78)

(2002) and Trice and Beyer (1993) agree that the identification of cultural forms is a valid approach when examining an organization's culture.

In this section on organizational culture, I have addressed cultural substance and cultural forms. Cultural substance is the shared systems of beliefs, values and norms. Two sources of influence on cultural substance were discussed, industry and occupations. Both sources can influence the beliefs, values and norms of an organization and its members. Cultural forms are the result of the actions and behaviors of the members and the organization. I will come back to this idea of cultural forms later when discussing strategic, operational, and drug therapy management activities. First I will discuss future time perspective as cultural substance.

CULTURE OF TIME

In Chapter 1, I discussed briefly two different perspectives of time, time as a resource and time as an aspect of organizational culture. The culture of time of an organization is expressed in its norms, values and beliefs. Hall (Bluedorn & Hall, 1998) and Schein (1992) both view time as a "taken for granted" aspect of culture. Schein (1992) places time within the most fundamental level of culture – the level where perceptions, thoughts and feelings are unconscious. Therefore, if an organization's culture reflects some sort of fundamental worldview (Schein, 1985; 1992), we should anticipate that this worldview underlies the organization's structures and processes. Zellmer-Bruhn et.al. (2001) also argue that time is a key factor in all layers or components of organizational culture. Thus, conceptions of time may influence the structures and process of an organization. In the following in discussion I will discuss briefly the areas of research examining time, followed by a discussion of two

conceptions of time, time as a resource as the dominant paradigm and time as a an element of organizational culture.

Research into Time

Time has been explored in a variety of disciplines including anthropology (Hall, 1976; Kluckhohn & Strodtbeck, 1961), cognitive psychology (e.g. Block 1978, 1982; (Cottle, 1976; Michon & Jackson, 1985), the physical sciences (e.g., Asimov, 1972; Darwin, 1859) and the social sciences (Bluedorn, 2000; 2002b; Fraser, 1975; March & Simon, 1958; McGrath & Kelly, 1986; Nowotny, 1989; Schein, 1985,1992; Schriber & Gutek, 1987). Researchers have used a variety of conceptualizations of time including, but not limited to: epochal versus fungible time, where epochal time is defined by events in contrast to fungible time which is based on clock time; polychronic versus monochronic time, where polychronicity is focused on doing multiple tasks while monochronicity is focused on doing one task at a time; temporal depth which is focused on how far forward or backward in time one looks; temporal focus which is focused on past, present or future orientations; punctuality, speed, timing and convergence (Bluedorn, 2002b). These various aspects of time have been used in research to explore relationships between these different aspects of time and national cultures, cultures of organizations, and cultures of work units within multi-national companies. This study focuses on time and aspects of community pharmacy practice.

Time as a Resource

As stated in Chapter 1, the greatest interest in "time" is as a resource, something of value due to its finite nature. How did time come to be viewed as a resource? Jaques (1982), Bluedorn (2002b) and others identify the invention of the clock as the event that led to the

time becoming viewed as a resource. The clock allowed for the development of minutes, seconds, and hours "which became part of many linguistic systems and thereafter structured the way many human groups saw time (Bluedorn, 2002b:29). Time and activities became something to be measured. As a result, time has become "man's most perishable resource" (Drucker, 1985:70).

Benjamin Franklin's (cf. Bluedorn 2002:29) famous metaphor "Remember that Time is Money" provides an example of time as a resource. During and after Western industrialization, this became more evident. Henry Ford's assembly line production for the Model-T emphasized the regularity-of-movement aspect of the clock's mechanism (Bluedorn 2002). This led to organizational practices that divided up the activities in the manufacturing process and routinized the work that individuals performed as a method of increasing production.

Changes in production technologies (Nowotny, 1989: 203) have allowed amazing gains in productivity since the beginning of industrialization. Rosenberg (1976) identifies these increases as being the result of the "rigorous and coherent application of the 'economies of time' to the industrial production process" (cf. Nowotny, 1989: 203; Rosenberg, 1976). Yet, this idea of the scarcity of time has spread to almost all aspects of social life. Many technologies available to organizations and individuals are promoted as *saving* time, with the implication, that saving time by using a particular technology, will allow more time to "spend" on other "more productive" activities.

This focus on time as something that is economically valuable is apparent in the management literature. As an example, Taylor's "Scientific Management" emphasized the use of scientific principles to determine the changes necessary in management practices to

improve labor productivity (Daft, 1991). Gersick (1988; 1989) examined time and pacing of work teams involved in projects with various deadlines and found that work teams "pace their use of a limited resource, time, in order to finish by their deadlines" (Gersick, 1988:33). As a result, deadlines seem to reinforce the idea of time as a resource. Thus, since the publication of Taylor's work, there has been a continued focus within much of the management literature on time as a resource. Deming's (1993) "Total Quality Management" and Ouchi's (1981; 1993) "Theory Z" are examples of this continued focus on time as a resource (Drucker, 1985). Yet, it is possible to view time from a different perspective.

Time as an Element of Organizational Culture[5]

How is time an element of organizational culture? In an interview with Bluedorn (1998:110), Hall observed that time is fundamental to human existence because "...everything in life occurs in a time frame – most of which is taken for granted." Based on the earlier discussion on organizational culture, time exists at the fundamental level of culture – the level where perceptions, thought and feeling are 'unconscious' (Bluedorn, 2000; Schein, 1992).

When anthropologists (e.g., Hall, 1976; Kluckhohn & Strodtbeck, 1961) began to examine time as an element of national and community cultures, this influenced other

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[5] The theme of the 2000 annual meeting of the Academy of Management was "A New Time". The goal of the theme, "A New Time" was to "stimulate and encourage new and creative research on time, an area of inquiry that plays important roles in both management research and practice, but that has not received as much scholarly attention as it warrants" (AOM, 2000). In 2001, the *Academy of Management Review* (Vol. 28, Issue 4) published an issue solely focused on advancing theoretical understanding of time in organizations. In 2002, a special research forum was published in the *Academy of Management Journal* (Vol. 45, Issue 5) based on the theme, "A New Time" from the AOM Annual meeting.

researchers to begin examining time and its influence on organizations and organizational culture. Hofstede (Hofstede, 1993; Hofstede & Bond, 1988; Hofstede, Neuijen, Ohayv, & Sanders, 1990) was one of the first researchers to examine the relationship between national cultures and the work in multi-national companies. This work was a precursor in the business literature to the examination of perspectives of time in organizational culture research. Schein, an early cultural researcher, began to focus on perspectives of time as an important aspect of organizational culture. He states (Schein, 1992:105) "the perception and experience of time is among the most central aspects of how any group functions…," for when people differ in their experience and perception of time there is the potential for miscommunication and other problems to occur. This view also is supported by Dubinskas (1988: 14), who points out that "time is a fundamental category that we use for talking about the orderliness of social life. In a modern organization … time appears to impose a structure … (it creates) a model of the way things are." Thus, differences in cultural elements such as time may affect work processes and how work is accomplished in an organization.

Hofstede and Schein began to lay the groundwork for further research on time and timing in organizations. As the research on time and timing has proliferated, the lack of coherence in the field has resulted in various paradigms, with no dominant paradigm being established (Abernathy & Utterback, 1988; Ancona, Okhuysen, & Perlow, 2001; Tushman & Anderson, 1986). The result has been that multiple overarching frameworks have been proposed to explain timing (Albert, 1995; Gersick, 1988,1989), time reckoning (Clark, 1985), and the experience of time in organizations (Butler, 1995). Four overarching frameworks relevant to this study of perspectives of time in organizational culture have been cited with some regularity by others: Schein (1992; 1999), Schriber and Gutek (1987),

Bluedorn (2001; 2002b), and Thoms and Greenberger (1995). Each of these authors has defined various dimensions of time in their work. Table 2-3 summarizes the dimensions that have been identified as key to this study.

Schein

Schein (1992) suggests "that time is reflected in the set of fundamental assumptions on which organizational cultures are built" (Zellmer-Bruhn, Gibson, & Aldag, 2001:22). The fundamental assumptions Schein (1992) focused on are related to the nature of human activity, the means chosen to achieve the goals of the organization, and the way actions are measured and corrective actions are taken. Thus, time is reflected in goals, processes and actions of the organization.

Schein identified five aspects of time that vary across organizational culture: (1) basic time orientation (past, present, near- and far-future orientation) (Kluckhohn & Strodtbeck, 1961), (2) monochronicity and polychronicity (Hall, 1959; 1976; 1983), (3) planning versus development time (Dubinskas, 1988), (4) time horizon, and (5) pacing. Each of these aspects will be reflected to some extent in the culture of the organization. This discussion will focus on his conception of basic time orientation. The other four aspects are important to consider, yet they are beyond the scope of the research aims of this project.

Schein based his *basic time orientation* on the anthropological work of Kluckhohn and Strodtbeck (1961) and Redding and Martyn-Johns (1979) which showed that cultures make assumptions about the nature of time and have a basic orientation toward the past, present or future. When applied at the level of the organization, Schein found that one can distinguish between organizations that are primarily past-, present- or future-oriented. An organization that has a past orientation focuses on how things have been done and as a result,

Table 2-3: Dimensions of Time Identified in Organizational Culture Research

Author Dimensions	Definitions
Schein (1992)	
Past, present, near- or far-future orientation	Basic orientation toward the past, present, or future. Past orientations focuses on how things used to be; present orientation focuses on getting the immediate task done; near-future focuses on quarterly results; distant future focuses on long term investments like R&D and building market share.
Bluedorn (2000, 2002)	
Temporal Focus	Degree of emphasis on past, present or future.
Temporal Depth	Temporal distances into the past or future typically considered when contemplating events that have happened, may have happened, or may happen.
Schriber & Gutek (1987)	
Future orientation	Emphasis on planning and future perspective.
Speed versus quality	Norms about importance of speed vs. quality.
Work pace	Norms about speed and pace of work.
Thoms & Greenberger (1995)	
Timeline orientation	Refers to the temporal context of space in time to which an individual is oriented (past, present, future) and the magnitude of this orientation; is a dimension of thought (cognition) not action.
Future time perspective	Extent to which the future drives current behavior; the higher the future time perspective, the farther into the future the individual is thinking, planning and directing behavior.
Time span	Amount or block of time one is capable of conceptualizing; suggests that higher level leaders have longer time spans – does not automatically assume that the executive has a high future-time perspective or even a conception of time.

Table adapted from Zellmer-Bruhn, Gibson, and Aldag (2001:26-27)

may rest on its laurels instead of working to improve the organization. A present focused organization concerns itself with getting immediate tasks done, the day-to-day activities necessary to survive to the next day. An organization that has a near-future focus may look out as far as the next quarterly results. Lastly, a far- or distant-future oriented organization may be more focused on long-term investments, building market-share, and organizational learning which may have a delayed impact on profits (Schein, 1992).

Bluedorn

Bluedorn (2000) expands upon Schein's dimensions (1992) of past, present, near- and far-future orientation. *Temporal focus* is defined as the orientation to the past, present or future (Bluedorn, 2000; 2002b). When describing the orientation to past, present and future, Bluedorn (2000:123) states "present time is 'timeless, traditionless and future ignoring' and is flanked by a realizable future and a past whose traditions are to be either maintained or restored." Perceptions are anchored with a referent to the past, present or future (Mosakowski & Earley, 2000). This anchoring is reflected as cultural manifestations of the organization (Hofstede & Bond, 1988; Hofstede, Neuijen, Ohayv et al., 1990) such as symbols, heroes, rituals, and values.

Bluedorn (2000; 2002b) recognizes another dimension related to past, present, and future orientations, *temporal depth*. Temporal depth addresses shortcomings identified by Bluedorn (2000) in Kluckhohn and Strodtbeck's (1961) and Hofstede and Bond's (1988) simple reliance on past, present or future orientation. Temporal depth is defined as "the temporal distances into the past and future that an individual or collectives typically considers when contemplating events that have happened, may have happened or may happen" (Bluedorn 2000:124). Bluedorn based the concept of temporal depth on Ebert and

Piehl's definition of time horizons, "that distance into the future which a decision-maker looks when evaluating the consequences of a proposed action" (Ebert & Piehl, 1973: 35). Bluedorn (2000) combines temporal focus and temporal depth into a 2 x 2 table to illustrate how these constructs can be viewed (see Figure 2-3). Thus, an organization may have a temporal focus on the past and present or the future and a temporal depth that is either short- or long-term. Bluedorn (2000) acknowledges that this cross-classification may oversimplify how time is constructed, based on the results of two other studies. Judge and Spitzfaden (1995) found that strategic managers employ portfolios of time horizons in relation to their activities; that is, specific activities require different time horizons. El Sawy's (1983) findings reported that a manager who looked further into the past also tended to look further into the future. Thus, Bluedorn's (2000) conceptualization of temporal focus and temporal depth may be considered as identifying ideal types that can be used as a guide to evaluate the time orientation of organizations and their members.

Schriber and Gutek

Schriber and Gutek's (1987) framework identified thirteen temporal dimensions of norms and work processes. Three of the dimensions are relevant to this study: future orientation, speed versus quality, and work pace. In this framework, time is conceptualized as "the norms that can be viewed as characteristics of culture" and that these "norms have temporal components that help integrate complex work processes and thereby facilitate the flow of work" (Schriber and Gutek 1987:642). This conceptualization of time, with its focus on time as embedded in artifacts and actions, is supported by others including Nowotny (1989) and Morgan (1986).

Figure 2-2: Cross Classification of Temporal Depth and Temporal Focus

		Temporal Focus	
		Past and Present	Future
Temporal Depth	Long-term	Deep Past	Deep Future
	Short-term	Shallow Past	Shallow Future

Bluedorn (2000:125)

Organizations use these norms to accomplish various goals, importantly, to create a sense of orderliness (Zerubavel, 1981) and to reduce feelings of uncertainty to maintain organizational health and effectiveness (Bluedorn, 1986; Katz & Kahn, 1978; Perrow, 1970). Yet, by focusing on these specific artifacts of the organization's culture, Zellmer-Bruhn, Gibson and Aldag (2001:28) argue that these dimensions "concentrate primarily on cultural manifestations of time, without addressing the underlying assumptions about time." That is, these dimensions are only artifacts (as Schein would describe) or elements visible at the surface of the culture of the organization; they ignore the underlying assumptions of how people and organizations construct time. Trice and Beyer (1993) would argue that these dimensions represent some of the cultural forms the organization has that facilitate and reinforce the organization's culture.

Thoms and Greenberger

Thoms and Greenberger (1995) also conceptualize time perspective. Their construct terms are somewhat different from the other three conceptualizations, yet the heart of their definitions is similar to the others. Timeline orientation, future time perspective and time span are dimensions of temporal alignment. Temporal alignment is defined as the "biases regarding the past, present, and future that the individual brings to the organization and influences the attention given and the value placed on past, present and future time" (Thoms & Greenberger, 1995:277). Timeline orientation refers to the orientation of an individual (or organization) to the past, present or future. This is similar to Bluedorn's (2000) concept of temporal focus and Schein's (1992) basic time orientation. Time span, as a dimension of temporal alignment, is the "amount or block of time one is capable of conceptualizing"

(Thoms & Greenberger, 1995:278), which corresponds to Bluedorn's (2000) concept of temporal depth.

These four conceptualizations of time (Bluedorn, 2000; Schein, 1992; Schriber & Gutek, 1987; Thoms & Greenberger, 1995) share a common focus on time perspectives. A difference that exists between the four conceptualizations should be highlighted. While Schein (1992) and Bluedorn (2000) provide conceptualizations that take into account past, present and future time orientation, Schriber and Gutek (1987) and Thoms and Greenberger (1995) focus only on future time perspective. Like Thoms and Greenberger, other researchers have focused on the future while omitting the past. Das (1987) focused on the future perspective of upper management and strategic planning activities. Similarly, in their study of opportunistic change in technology-based ventures, West and Meyer (West III & Meyer, 1997) focused on a management team's orientation to the future and how it related to strategic change.

Research on time perspectives has examined an individual's orientation to past, present and future time. At the organizational level, Doucette and Koch (2000) found that "futurity of decisions," the degree to which a longer timeline is considered in decision-making, was one of several characteristics that distinguished pharmacies that had adopted the drug therapy management paradigm from those pharmacies operating under a product-focused, transaction-based model of practice.

The focus of this study is the present and future time perspectives of community pharmacists and pharmacies, and as a result, temporal alignment and its components have been chosen as the time-based constructs for this study. The rationale for this choice is two-fold: (1) Thoms and Greenberger (1995) present a conceptualization that can, if so desired,

take into account past, present and future orientations and (2) the concept of future time perspective allows behaviors to be taken into account when examining the orientation of individuals and organizations. The activities and behaviors that are the focus of this study are the strategic, operational and drug therapy management activities that are a part of community pharmacy practice. The following section discusses the relevance of each of these management activities.

MANAGEMENT ACTIVITIES AND COMMUNITY PHARMACY

When examining contents of general management textbooks (e.g., Daft 1991; Griffin 1990), four basic functions of management are identified: planning, organizing, implementing (or influencing or leading), and controlling. These basic functions are the "building blocks" used to teach and discuss management (Figure 2-3 presents the process of management). In contrast to this focus on activities, Mintzberg (1973) defines management as a set of managerial roles: interpersonal, informational and decisional. Mintzberg's framework of managerial roles developed from his observational work (1973) of five CEOs and the activities and roles that they engaged in, in their positions. Although these approaches differ, it is possible draw upon both to define management as a "process of planning, organizing, implementing and controlling carried out by people (managers) who must use interpersonal, information and decisional skills to create successful organizations" (Nance, 2002: 1). The following discussion uses the traditional functions of management as the framework because the focus of this study is on activities carried out within the organization by management and staff and not on the roles of the managers themselves. Next

Figure 2-3: The Process of Management

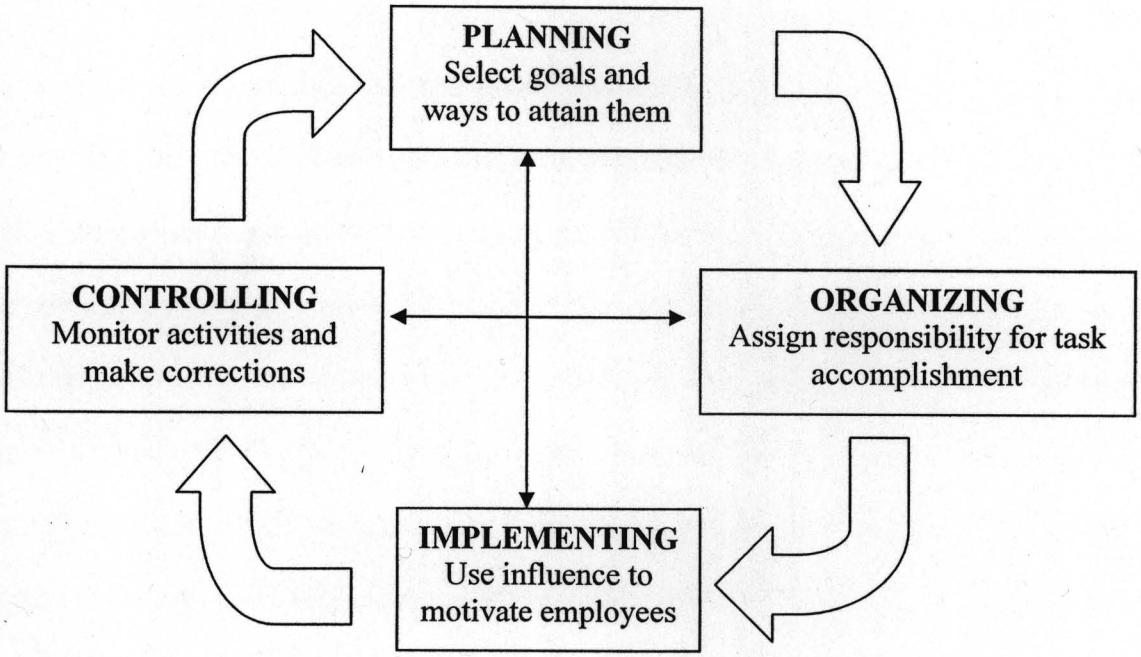

Figure adapted from Daft (1991:6)

I will define briefly the four functions of management and then more fully discuss the management activities related to community pharmacy practice.

The first function of management is planning. Planning is the process of "defining goals for future organizational performance and deciding on the task and use of resources needed to attain them" (Daft, 1991:6). Thus, planning is a process where the goals and allocation of resources of the organization are determined. The next step in the management process is organizing. Organizing involves the assignment of tasks, the grouping of tasks into departments or functional areas, and the allocation of resources to specific departments or functional areas (Daft, 1991; Griffin, 1990). This facilitates and gives direction to activities within the organization. Organizing is followed by implementing [6], the set of activities necessary to help members of the organization work together to accomplish the goals of the organization (Griffin, 1990). The last function of management is controlling. Controlling is the process concerned with monitoring, evaluation, and corrective actions (Daft, 1991; Griffin, 1990).

The elements depicted in the Organizational Pyramid (i.e., goals, structure, resources, tasks, personnel, technology, the environment, and culture) are related to the areas covered by the four functions of management. For example, goals and structure are related to planning, while tasks and technology may be related to organizing. The implementing function is related to tasks and personnel, while the controlling function is related to personnel and resources. Thus, behaviors related to and the awareness of these managerial functions can be examined to identify the cultural substance and cultural forms of an

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[6] Other terms have been used for the implementing function including, leading (Griffin 1990, Daft 1991) and coordinating (Mintzberg 1989).

organization regarding the potential relationships between future time perspective and management activities. Three areas of management activities involved in community pharmacy practice are strategic management (i.e., planning), operational management (i.e., organizing, implementing and controlling) and drug therapy management i.e., patient care management). The following discussion focuses on these three areas of management.

Strategic Management

Planning is the process of goal definition, task assessment, and general resource allocation (Daft, 1991). Mintzberg (1989, 1994) splits this definition into two activities, planning, which is about analysis, and strategic thinking, which is about synthesis. Planning is one part of a multi-faced set of activities and process called strategic management. Strategic management has four key attributes: it is directed at overall organizational goals, includes multiple stakeholders, has both short-term and long-term perspectives, and incorporates trade-offs between efficiency and effectiveness (Dess & Miller, 1993). Thus, the planning process is to be used to help the organization identify its goals, what tasks are needed to reach those goals, and what resources are to be allocated to accomplish those goals.

In examining the strategic management literature, studies have focused on various aspects of strategic management. These aspects include typing organizations according to Miles and Snow's strategic types of defenders, prospectors, analyzers and reactors (Conant, Mokwa, & Varadarajan, 1990) and identification of the strategy-making process (command, symbolic, rational, transactive, and generative) and its relationship to performance (Hart & Banbury, 1994). Boyd and Reuning-Elliott (1998:181) in a critique of the field state that

"even after 20 years, researchers are still debating how to operationalize key strategy constructs such as performance, organizational environment" and others.

Various tools have been developed to facilitate the process of strategic planning. Rea and Kerzner (1997) and Cook (1994) have written practical guides and identified tools that promote strategic thinking. Theses tools include: analysis of strengths, weaknesses, opportunities and threats (SWOT analysis); development of a mission statement; development of a vision statement; strategies (plan); and performance measures. The purpose of the mission statement is to "clarify the organization's purpose and who it serves," while the vision statement "proclaims the desired state of affairs", proclaiming what the organization wants to be (Rea & Kerzner, 1997:8). Daft (1991:125) uses the term *organizational mission*, which encompasses both the vision and mission statements defined by Rea and Kerzner, and is the philosophy by which the organization functions. Daft (1991: 125) defines the mission statement as "a broadly stated definition of the organization's basic business scope and operations that distinguish it from similar types of organizations."

While the vision and mission statements are the destination, strategies are the road maps used to reach them. Thus, strategies help the organization anticipate and respond to threats and opportunities experienced while trying to reach its desired destination. In examining the pharmacy literature on strategic planning and on management in general, heavy emphasis historically has been placed on actions instead of strategic thinking and planning as a process (Gagnon, 1989; McCaffrey, Bentley, Banahan, Garner, & Ladner, 1997; National Association of Retail Druggists, 1994). It was not until 1988 when the American Association of Colleges of Pharmacy (AACP) in conjunction with the National Association of Chain Drug Stores (NACDS) and the National Association of Retail Druggists

(now NCPA) announced new curriculum goals that increased the emphasis on pharmacy practice management (Anonymous, 1988). Currently, two of the five goals of the PharmD curriculum focus on pharmacy management: (1) managing the pharmacy and (2) developing and managing medication distribution and control systems (American Association of Colleges of Pharmacy, 2003).

Strategic management activities have a time element embedded within them, as illustrated by a statement by Minztberg (1989:27), that "strategies are both plans for the future and patterns from the past." Thus, strategies are guides for future behavior using information from the past. Das (1987) and El Sawy (1983) both found that managers with a longer future time perspective thought further into the future with regard to planning activities in banking and small technology firms, respectively.

Doucette and Koch (2000), in a small case-study of six independent pharmacies, showed that "futurity of decisions," that is, the degree to which a long-term timeline is considered in decision-making, distinguished pharmacies that had changed to a patient-care model of practice from those pharmacies still practicing under a product-focused, transaction-based model of practice. This example in pharmacy illustrates that future time perspective could be related to change within pharmacy organizations. Based on the previous discussion related to time and cultural forms, it is then important to examine the relationship between future time perspective and strategic management activities.

Operational Management

Activities related to the other three functions of a manager, i.e., organizing, implementing and controlling, follow from the strategic management activities discussed above. These activities are related to the day-to-day running of the organization and

collectively comprise what I refer to as operational management activities. I will discuss each of the functions separately.

Organizing Activities

Daft (1991:245) defines organizing "as the deployment of organizational resources to achieve strategic objectives." Griffin (1990) and Daft (1991) conceptualize organizing as the creation of the structural aspects of the organization. This includes developing reporting structures, designing jobs, managing change, and grouping activities. A variety of reporting structures exist; the choice of reporting structure(s) that an organization uses depends on factors such as degree of formalization, how groups will be grouped together (e.g., function, department, team), and how centralized the organization is. Within the pharmacy department, community pharmacies are relatively flat organizations as the categories of staff are minimal. Typically there is a pharmacy manager, one or more staff pharmacists, one or more pharmacy technicians, and there may be a small number of other support personnel. Thus, in community pharmacies, the number of employees within the pharmacy department may range from one, (i.e., the pharmacy manager only) to as many as 20 depending on the services and prescription volume of the pharmacy.

Job design and grouping activities are also part of the organizing function. Job design determines who will perform specific tasks or kinds of work (Griffin, 1990). In community pharmacy departments, much, but not all, of the job design is determined by state statutes and administrative code (Abood & Brushwood, 2001). The Board of Pharmacy provides details concerning what activities are to be performed by a pharmacists and what activities the pharmacist may delegate to a pharmacy technician, pharmacy intern, or other support person. This drives the grouping of activities performed within the pharmacy department.

As community pharmacy departments are relatively flat in structure and the job design is dictated to a degree by state statutes and administrative code, what cultural forms of the organization might be useful to examine? As Daft's definition indicates, the organizing function is concerned with the deployment of organizational resources. Scheduling of staff and updating of pertinent information systems (e.g., drug information databases) are two areas that examples of how and when resources are deployed.

Implementing Activities

The management literature has used various terms for the implementing function, including leading and commanding (Daft 1991; Griffin 1990). Implementing "provides the processes used by members of the organization to work together to further the interests of the organization" (Griffin 1990:10). Four core areas of activity are related to the implementing function: leading, motivation, teamwork, and communication. Leading is discussed in the literature as the leadership of an *individual* manager (Daft, 1991; Griffin, 1990) to his/her department, unit, etc. Literature in this area has focused on leadership styles and the use of power. Individual leadership is important in managing, yet other members of the staff may also take leadership roles within the team, department or organization.

The other three core areas of activity, motivation, teamwork and communication are also important to implementing. Motivation is the ability of the organization to provide the processes within which members can learn and function within the organization (Daft, 1991; Griffin, 1990), processes which include training and skill development. Training is a mechanism by which members learn their roles and functions within the organization to help them acclimate. Skill development on the other hand provides the means for members of the organization to gain new skills that may allow for promotion and/or increased job

satisfaction. In community pharmacies, implementing activities include staff training (i.e., whether there is staff training and, if so, how formalized is it), the length of staff training (both pharmacist and technician), and the facilitation of additional skill acquisition by staff members. In pharmacy these additional skills may include such areas as certification in immunization delivery and Board of Pharmaceutical Specialties (BPS) certification. These activities are examples of how the organization uses its resources to help employees work towards and obtain organizational objectives.

Controlling Activities

While implementing activities are focused on processes and coordination, controlling activities are focused on monitoring of those activities. Controlling is defined as "the management function concerned with monitoring employees' activities, keeping the organization on track toward its goals and making corrections as needed" (Daft 1991:9). Thus, control occurs in relation to quality and productivity, management control systems, and information systems, (Daft, 1991; Griffin, 1990). Many of the activities related to information systems management are carried out by other departments within the larger organizations within which many community pharmacies are embedded and thus, are not activities or functions that are carried out within the pharmacy department. Independently-owned pharmacies are more likely to outsource activities related to information systems management. In contrast, activities related to control for quality and productivity, and management control systems are relevant at the level of individual pharmacies.

Activities related to quality and productivity control provide feedback related to performance and quality assurance/quality improvement. Feedback such as performance reviews allows for both positive and corrective action to be taken with a member of the

organization. There has been an increased interest in quality assurance/quality improvement programs as a result of two Institute of Medicine (IOM) reports, *To Err is Human* (Kohn, Corrigan, & Donaldson, 2000) and *Crossing the Quality Chasm* (Institute of Medicine, 2001) that focused attention on medical and medication errors and called for fundamental changes to improve the quality of health care. Thus, evaluation of quality assurance/quality improvement is another aspect of controlling as a feedback tool.

Activities related to management control systems include financial control and budgeting. With the majority of community pharmacies owned by health-systems or corporate chains, most pharmacists who provide patient care are not involved in the budget-setting process related to their specific pharmacy's operations. Financial control, on the other hand, is very relevant to pharmacists because of the payroll and medication costs associated with running a pharmacy. Therefore, performance reviews, quality improvement/quality improvement programs and financial control activities are examples of controlling activities in a community pharmacy.

Drug Therapy Management

Recall that drug therapy management is defined as "that component of the health care system that seeks, through the caring, collaborative efforts of a team of pharmacists, physicians, nurses and other health practitioners, to ensure the medications are used appropriately to improve patient health status" (Academy of Managed Care Pharmacy, 2002:1). The movement to drug therapy management has its roots in Brodie's notion of drug-use control as the "keystone to pharmaceutical service ... the mainstream function of pharmacy" (Brodie, 1966) and Helper and Strand's (1990) paper on pharmaceutical care which outlined a major rethinking of and, presumably, change in professional roles and

responsibilities of community pharmacy and pharmacists. Drug use control is defined as "a system of knowledge, understanding, judgments, procedures, skills, controls, and ethics that ensures optimal safety in the distribution and use of medications" (Brodie, 1966). As the keystone to pharmaceutical services, drug-use control provides purpose, direction, and recognition of the patient-pharmacist relationship and is the essential ingredient for the provision of pharmacy services. From Brodie's idea of drug use control to drug therapy management, at the heart of changes within the practice of pharmacy is the pharmacist's ability to help patients with their medications.

Reports concerning the high rates and costs of drug-related morbidity and mortality (Manasse, 1989a,1989b; Talley & Laventurier, 1974) was one of the impetuses for Hepler and Strand's new model of pharmacy practice (Cipolle, Strand, & Morley, 1998,2003). Concerns related to drug-related morbidity and mortality continue to be an issue driving changes in the U.S. health care system with the publication of several reports critiquing the current health care delivery system (Cohen, 1999; Institute of Medicine, 2001; Kohn, Corrigan, & Donaldson, 2000). Pharmaceutical care, as defined by Hepler and Strand , is a way of practicing pharmacy to "help patients obtain the best possible drug therapy and especially protect the patient from harm" (1990:539).

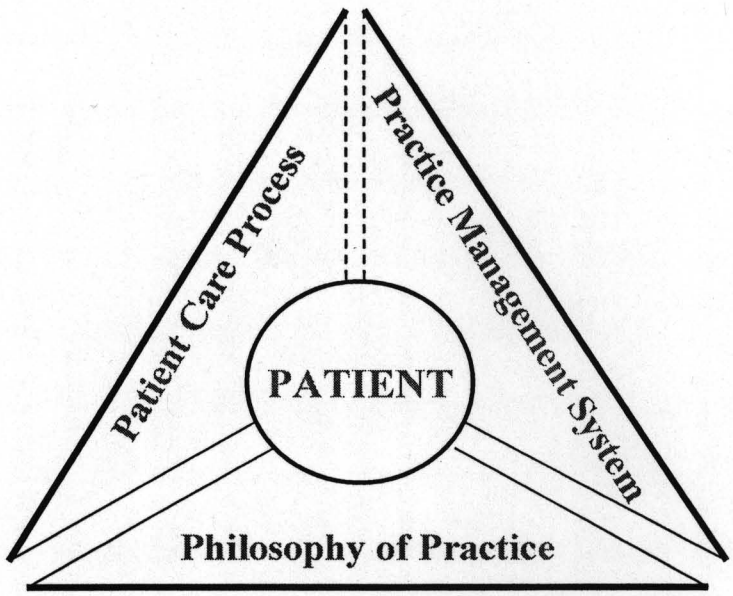
The keystone of this new way of practicing pharmacy is based on the creation of a fundamental relationship between the patient and the pharmacist, in which the patient grants the pharmacist authority to provide care and the pharmacist accepts this responsibility (Hepler & Strand, 1990). Strand and colleagues (1997, 1998) amended the original definition of pharmaceutical care to add that the covenantal relationship between the pharmacist and the patient is to focus on the patient's *needs*. For Strand and colleagues, this

solidifies the patient-centered focus of pharmaceutical care as illustrated in Figure 2-4 (Cipolle, Strand, & Morley, 1998; 2003).

The three components of pharmaceutical care are (1) the philosophy of practice, (2) the patient care process and (3) the practice management system (Cipolle, Strand, & Morley, 1998). Thus, providing pharmaceutical care requires change in the philosophy of practice, the patient care process, and management of the pharmacy. The patient care process corresponds to what has been discussed here as drug therapy management. The practice management system incorporates the concepts of strategic and operational management. Others also have concluded that management of all aspects of the pharmacy is necessary for the provision of the type of patient-centered care advocated by the concept of drug therapy management (Hagel & Rovers, 2002; Holland & Nimmo, 1999a,1999b; Nimmo & Holland, 1999a,1999b-b,2000).

Since the publication of Helper and Strand's work (1990), there have been elaborations and redefinitions of the pharmaceutical care philosophy. Hepler and Strand subsequently diverged in their application of pharmaceutical care. Strand and colleagues established the Minnesota Pharmaceutical Care Project with the goal to provide comprehensive pharmaceutical care to *all* patients. Pharmacist activities included establishment of a relationship with the patient, assessment, creation of care plans, patient education, recommendations and referrals, and patient monitoring and follow-up (Posey, 1997; Tomechko, Morley, & Strand, 1996; Tomechko, Strand, Morley, & Cipolle, 1995). In contrast, Hepler and colleagues in the Therapeutic Outcomes Monitoring (TOM) project, focused pharmacist training on one specific disease state at a time (e.g., asthma, diabetes,

Figure 2-4: Pharmaceutical Care Practice



Cipolle, Strand and Morley (1998:238)

angina, hypertension, hyperlipidemia) (Grainger-Rousseau, Miralles, Hepler, Segal, & Ben-Joseph, 1997; Hepler, 1997; Herborg, Sondergaard, Frokjaer, Fonnesbaek, Hepler, & et al., 1996; Posey, 1997).

In their review of patient-oriented pharmacy practice, Rovers and Bajcar (2002) identify five advanced pharmacy patient care practice models: clinical pharmacy, disease management, pharmaceutical care, integrated pharmaceutical care services, and total pharmacy care. Table 2-4 provides a brief description of each of the five practice models identified by Rovers and Bajcar. The practice models are presented in increasing order of pharmacist involvement with his/her patients; clinical pharmacy is the precursor to the other four practice models. AMCP (2002) in *Pharmacy's Framework For Drug Therapy Management in the 21st Century* uses the term drug therapy management to describe patient-centered model of practice and for continuity this term will be used for the rest of the discussion. The focus of each of these practice models is ensuring the appropriate use of medications to improve the health outcomes of patients. As a result each model moves pharmacists and pharmacies from a product-focused, transaction-based practice to one that is patient-focused and relationship-based. Just as time is embedded in strategic and operational activities, time also is embedded in patient care activities. Smaller spans of time are necessary for patient care activities that are product-focused and transaction-based as these patient encounters are episodic in nature. On the other hand, the ability to provide continuous, longitudinal care to a patient requires an ability to think into the future.

Summary of Management Activities

Management occurs in all areas of pharmacy practice and includes both management

Table 2-4: Patient-oriented Pharmacy Practice Models

Practice Model	Description
Clinical pharmacy	The precursor to pharmaceutical care; patient becoming the focus of pharmacy practice.
Disease management	Involves providing education and other clinical services to patients with specific disease states (i.e., asthma, diabetes).
Pharmaceutical care	Promotes pharmacists taking responsibility for patient outcomes.
Integrated pharmaceutical care services:	Promotes pharmacists' responsibility for both patient care and drug product distribution.
Total pharmacy care	Describes pharmacy practice as a combination of the five subunits: distribution, self-care, drug information, clinical pharmacy and pharmaceutical care.

Adapted from Rovers and Bajcar 2002:22

of the pharmacy as an organization and management of patients' drug therapy. As discussed above, strategic and operational management activities facilitate the organization's ability to reach its goals and objectives. This occurs through different, yet related activities. Strategic management allows the organization to identify "what" it is and what it wants to be to employees, customers and others in the environment. Strategic management, by definition, implies some ability to plan for the future; it does not stipulate, though, how far into the future. Operational management activities are those day-to-day activities that help the organization reach its goals and objectives. This includes organizing, implementing and controlling activities. Time also is embedded in these activities, relating to "how" and "when" these activities are performed. Lastly, drug therapy management is focused on the provision of continuous, longitudinal patient care. Thus, is it necessary for pharmacists who are involved with drug therapy management to be involved in, or at least aware of, strategic and operational management activities? Within each of these management activities, cultural forms can be identified that provide a picture of the time culture of community pharmacies.

RESEARCH IN COMMUNITY PHARMACY

Intervention research is one of the areas of focus within the pharmacy practice literature. Diverse pharmacy practice organizations have attempted to implement services and test interventions related to the provision of drug therapy management activities like those discussed above. Often, they have made organizational changes to help facilitate the implementation of such services in their pharmacies. Efforts have included increasing pharmacist involvement in patient counseling, adherence monitoring (Lipton & Bird, 1994), disease state management programs addressing selected patient populations(s) (Bluml,

McKenney, & Cziraky, 2000; Gourley, Gourley, Solomon, Portner, Bass, Holt, Braden, Rawls, Wicke, Ogden, & Lawrence, 1998; Grainger-Rousseau, Miralles, Hepler et al., 1997; Solomon, Portner, Bass, Gourley, Gourley, Holt, Wicke, Braden, Eberle, Self, & Lawrence, 1998), and full-scale implementation of pharmaceutical care services for all patients (Bloom, 1998; Cranor, Bunting, & Christensen, 2003; Cranor & Christensen, 2003a; 2003b; Spurgeon, Noble, Byrd, King, Dancer, Vinson, Horton, & Stevens, 1999; Tomechko, Strand, Morley et al., 1995).

While each of these efforts to move pharmacy practice toward a patient-focused, relationship-based model of care, varying magnitudes of change are seen in the different types of programs implemented. Further, efforts to change community pharmacy practice have met with varying degrees of success regarding the impact (i.e., clinical goal attainment) and/or implementation (i.e., actually doing what the program specified) (Berardo, Kimberlin, McKenzie, & Pendergast, 1994; Bluml, McKenney, & Cziraky, 2000; Cranor, Bunting, & Christensen, 2003; Cranor & Christensen, 2003a; 2003b; Grainger-Rousseau, Miralles, Hepler et al., 1997; Johansen, 1999). Berardo et.al. (1994) examined community pharmacists' documentation of interventions related to identification of drug related problems in the elderly. The researchers found considerable variation in the likelihood that a pharmacist would identify a problem in his/her targeted population: 18 of the 45 pharmacists identifying problems in each of the reports they submitted while 13 pharmacists identified problems in less than 40% of the reports they submitted (Berardo, Kimberlin, McKenzie et al., 1994: 186). The Project ImPACT study on hyperlipidemia (Bluml, McKenney, & Cziraky, 2000) was a multi-site study involving 26 pharmacies in several different areas of the United States. The goal of this project was to demonstrate that pharmacists, working

collaboratively with patients and physicians, could help patients achieve goals established by the National Cholesterol Education Program. The intervention did show that pharmacist involvement when compared with the existing health care delivery system, represented a twofold to fourfold improvement (Bluml, McKenney, & Cziraky, 2000: 163). No data related to pharmacist or pharmacy participation was included in the report. The Asheville Project (Cranor, Bunting, & Christensen, 2003; Cranor & Christensen, 2003a,2003b) is a five year study of community pharmacist provision of pharmaceutical care services to diabetes patients in Asheville, NC. The goals of the project included assessing the clinical, economic and humanistic outcomes of pharmaceutical care services. Published reports addressing the project goals related to clinical, economic and humanistic outcomes of the study (Cranor, Bunting, & Christensen, 2003; Cranor & Christensen, 2003a,2003b) have focused on the intervention, the impact on achievement of patient goals and cost savings to the employer. Interim results of the study have shown improved A1c in patients receiving ongoing pharmaceutical care services and employers experienced a decline in mean total direct medical costs (Cranor, Bunting, & Christensen, 2003:173). Though twelve pharmacies are involved in the study, data are not provided about the pharmacies themselves. Grainger-Rousseau and colleagues (Grainger-Rousseau, Miralles, Hepler et al., 1997) created an educational training program for pharmacists to assist them in providing and documenting drug therapy management services to asthma patients. Twelve pharmacists began the project with seven pharmacists completing all phases of the study. The adherence rate to the program protocol for pharmacists ranged from 0% to 65% (Grainger-Rousseau, Miralles, Hepler et al., 1997:658). Beney, Bero and Bond (2000) in a review of intervention studies in community pharmacy practice found the majority of intervention studies targeted patients

and/or health care providers. Evaluation of individual pharmacist involvement did occur in some of the studies, yet pharmacy related organizational factors were seldom evaluated as seen in the studies described above.

Studies that have attempted to determine the reason for the success or failure of process changes in community pharmacy practice organizations generally have studied individualistic factors as the major determinants of success or failures (e.g., Berardo, Kimberlin, McKenzie et al., 1994; Odedina, Segal, Hepler, Lipowski, & Kimberlin, 1996a). Individualistic factors of potential interest include the skills, motivation, and attitudes of individual organizational members (e.g., pharmacist or pharmacy technician) (e.g., Berardo, Kimberlin, McKenzie et al., 1994; Christensen & Hansen, 1999). Berardo, Kimberlin, McKenzie et.al. (1994) identified significant relationships between the likelihood of pharmacist interventions and specific pharmacist characteristics such as lower levels of job satisfaction, having less perceived control over the amount of patient counseling done, having greater confidence in patient communication skills, and more positive perception of having enough time to consult with physicians when drug-related problems were identified. Christensen and Hansen (1999) examined both individual and pharmacy characteristics and their relationship to provision of cognitive services and the amount of cognitive services performed by pharmacists. They found that pharmacist owners-managers and pharmacists who perceived the documentation as less burdensome were more likely to document cognitive services (Christensen & Hansen, 1999: 645). Pharmacy characteristics that were significant predictors of cognitive service documentation were perceptions of the pharmacist-in-charge (i.e., pharmacy manager) and the number of full-time equivalent pharmacists employed at the pharmacy.

There are limitations of using individualistic factors as the determinants of success or failure in change initiatives. Individuals work in organizations that have rules, norms and cultures (Schein, 1992; Senge, 1993). These rules, norms and cultures may facilitate or hinder the change process. Johansen (1999) found that changes in organizational factors (e.g., remodeling, complexity) influenced how far and how fast change in community pharmacy occurs. Remodeling had a positive relationship to change in the pharmacies studied. Complexity is related to the number of social positions in the pharmacy. Johansen (1999) found that the presence or absence of specific social positions made a difference in program implementation outcomes. The presence of pharmacist staff members was positively related to remodeling and to achieving desired changes in pharmacists' behaviors, while the presence of technician supervisors was negatively related to pharmacists' performance of drug therapy management activities. Doucette and Jamulingam (1999) found that ownership type, adequacy of resources and organizational structure were positively related to entrepreneurial orientation of the pharmacy. Doucette and Koch (2000) in a case study of six independent pharmacies found that the three pharmacies that were more future oriented in strategic decision-making were the pharmacies that had adopted a patient-centered model of practice. Thus, organizational factors influence pharmacy's provision of drug therapy management services and activities.

In summary, the majority of pharmacy practice research related to drug therapy management activities has focused on individualistic factors. Only a few studies have shown that organizational factors influence practice change. Since pharmacists work in organizations, it is important to continue to examine the organizations impact on changes in pharmacy practice.

INTERPRETATION OF THE LITERATURE

The profession of pharmacy is advocating a change in both the philosophy of pharmacy practice and the actual practice of pharmacy from a product-focused, transaction-based model to a patient-focused, relationship-based model of practice. This change in philosophy and practice has been influenced by the environment, including pharmacy education, economics and federal and state laws and regulations. While environmental influences have pushed for this change in practice philosophy, not all community pharmacies are providing drug therapy management services. Possible reasons for the seemingly slow adoption of drug therapy management include the pharmacist shortage, the increase in the number of prescriptions filled, and as a result the lack of time to provide these services. Time in this circumstance is viewed as a resource, something to be used efficiently and not wasted.

Looking at time instead as an element of the organization's culture provides a different lens to examine the various management activities in community pharmacy. Drug therapy management, with its focus on continuous and longitudinal patient care, requires thinking beyond the immediate dispensing of medication to provide this type of care. Creating a patient care plan, for example, requires a future time perspective in much the same way as creating an organizational strategic plan requires a future time perspective. Previous research has identified a relationship between future time perspective and strategic planning in the banking and technology industries. This research proposes to examine the relationship between future time perspective and strategic management in community pharmacies and to extend this investigation to explore relationships with operational

management and drug therapy management. The conceptual model is presented in Figure 2-5.

RESEARCH HYPOTHESES

Three research aims address guide the present study. These aims and the related hypotheses follow.

Research Aim 1: Describe community pharmacies in regard to their future time perspective and their strategic, operational and drug therapy management activities.

Research Aim 2: Examine the relationship between future time perspective and strategic, operational and drug therapy management.

H1: The higher the future time perspective of the pharmacy, the more future-oriented the pharmacy is in strategic management.

H2: The higher the future time perspective of the pharmacy, the more future-oriented the pharmacy is in operational management.

H3: The higher the future time perspective of the pharmacy, the more future-oriented the pharmacy is in drug therapy management.

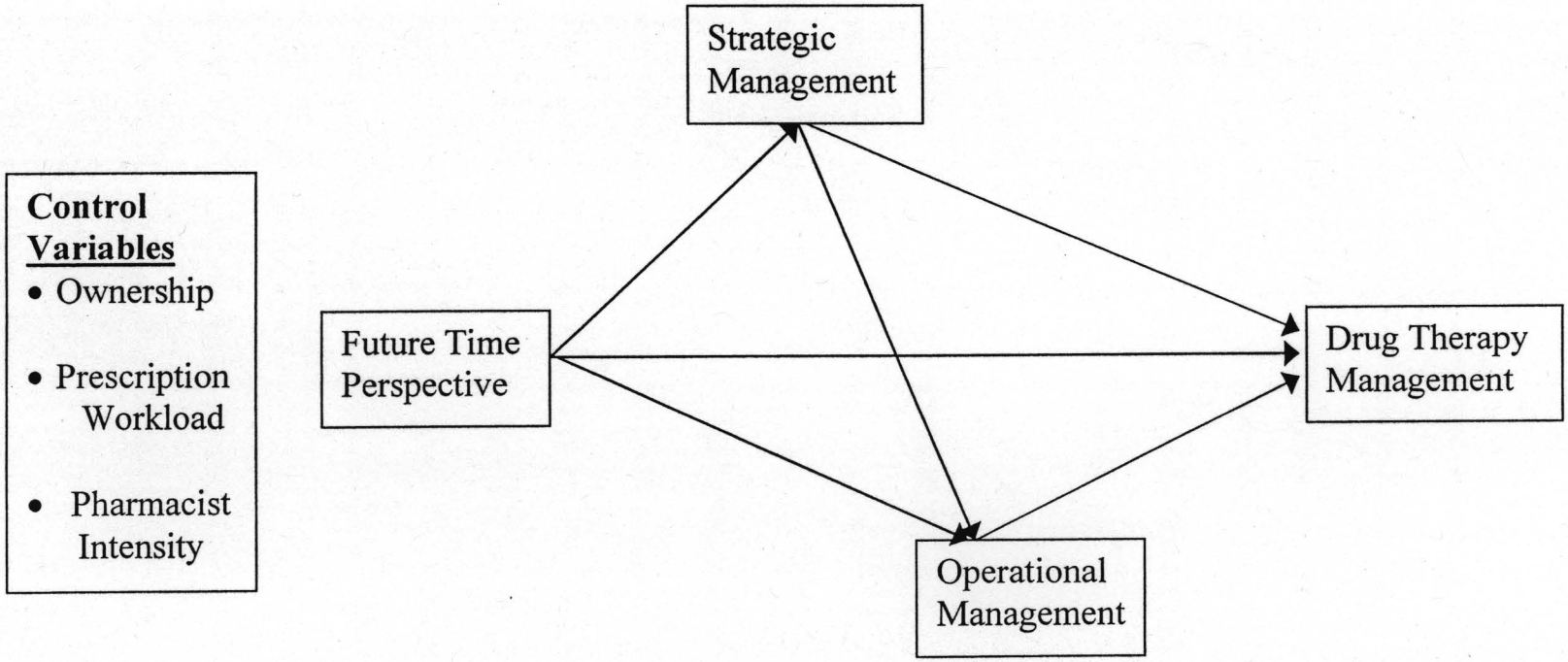
Research Aim 3: Examine the relationship between strategic and operational management and drug therapy management.

H4: The more future-oriented the pharmacy is in strategic management, the more future-oriented the pharmacy is in operational management.

H5: The more future-oriented the pharmacy is in strategic management, the more future-oriented the pharmacy is in drug therapy management.

H6: The more future-oriented the pharmacy is in operational management, the more future-oriented the pharmacy is in drug therapy management.

Figure 2-5: Research Model



CHAPTER 3: RESEARCH METHODOLOGY

The research aims and hypotheses proposed in Chapter 2 were driven by my interest in future-time perspective and organizational factors in community pharmacy practice. The discussion in this chapter focuses on the research design I used to address these aims and hypotheses. I first will describe the procedures for developing the sampling frame, followed by the data collection procedures. In Chapter 4, I will present the development of the measures.

STUDY POPULATION

My research aims and hypotheses guided the choice of the study population. The model and attending hypotheses were evaluated in a stratified, systematic random sample of community/ambulatory pharmacies involved in the University of Wisconsin, School of Pharmacy's Experiential Learning Program (UW SOP ELP). The decision to use the UW SOP ELP community pharmacies was based on several factors. First, while there are approximately 1,000 community and ambulatory pharmacies in the State of Wisconsin, existing research (Bloom, 1998; Cranor & Christensen, 2003a; Spurgeon, Noble, Byrd et al., 1999; Tomechko, Strand, Morley et al., 1995) supports that only a small percentage of pharmacies in general, provide the high levels of advanced patient care required by drug therapy management. Based on discussions with faculty involved with the Experiential Learning Program, many of the pharmacies identified as examples in the state as providing, or moving in the direction of providing, drug therapy management were pharmacy practice sites for the Program. Therefore, sampling Program pharmacies would increase the chances of including more progressive pharmacy sites. Second, there are three major ownership

categories of community and ambulatory pharmacies: independently-owned, health-system owned, and corporately-owned chain pharmacies. With a simple random sample, there is a potential for over- and under-representation of pharmacies by ownership category which may result in a less-representative sample than is present in the population. The UW SOP ELP contained a readily identifiable population of community and ambulatory pharmacies that appeared to represent the diversity of ownership categories.

The study population was drawn from the 2002 list of pharmacies involved in the "Ambulatory Pharmaceutical Care Clerkship" and the "Pharmaceutical Care Specialty Clerkship." This list contained sites involved in community pharmacy, ambulatory pharmacy, hospital pharmacy and specialty settings (e.g., long-term care, hospice, administrative) within and outside of Wisconsin. The diversity of pharmacy practice settings represents the range of work settings available to pharmacists. Differing pharmacy practice settings are governed by differing and sometimes overlapping sets of rules and regulations at both the state and federal level (e.g., state Boards of Pharmacy, state Departments of Health, Food and Drug Administration). To control for the variability in rules and regulations that govern different practice settings and different states, this study focused on community and ambulatory pharmacies in a single state (i.e., Wisconsin). Ambulatory pharmacies are defined as out-patient clinic-based pharmacy practices that are owned and operated by health-systems (e.g., hospitals). These pharmacies are governed by the same rules and regulations that govern traditional community pharmacies (i.e., independently-owned and corporately-owned chain pharmacies). Therefore, for the rest of the discussion, the term "community pharmacy" refers to both traditional community and ambulatory pharmacies. Hospital out-patient pharmacies were excluded from the sampling frame for two reasons.

First, many are involved in dispensing prescriptions for acute care patients at discharge and/or hospital employees only. Second, in many instances pharmacists work in both the in-patient and out-patient pharmacies of the hospital, making it difficult for them to respond to survey questions addressing the management and patient care activities that occur specifically in the out-patient pharmacy.

One hundred and eleven community and ambulatory pharmacies were identified from the list obtained from the UW SOP ELP. The list contained the names of pharmacy clerkship preceptors at each of the pharmacies. While preceptors were not necessarily the pharmacy manager at each pharmacy, a list of registered pharmacies in the State of Wisconsin obtained in April 2002 provided the names of the pharmacy managers for each licensed pharmacy. This was cross-referenced with the UW SOP ELP list to identify the managing pharmacist, i.e., the pharmacist legally responsible for a particular pharmacy and its activities.

SAMPLE SIZE AND SAMPLING

Sample size was calculated based on the size and expected variation in the sampling frame. Probability sampling is done to reduce the sampling error and increase the ability to generalize the results (Dillman, 2000). Bartlett II, Kotrlik, and Higgins (2001) identify Cochran's (1977) formula as appropriate for use in determining the appropriate sample size for organizational survey research. Using Cochran's formula for continuous data:

$$n_o = \frac{(t)^2 * (s)^2}{(d)^2}$$

Where:

n_o = required return sample size

t = value for selected alpha level (for alpha 0.05, t = 1.96)

s = estimate of standard deviation in the population

d = acceptable margin of error for mean being estimated

Bartlett, Kotrlik and Higgins determined sample sizes for various population sizes at three levels of alpha (0.10, 0.05, and 0.01), using a margin of error equal to 0.03 (Bartlett, Kotrlik, & Higgins, 2001:48). For a population size of 100 with t = 1.96, and the margin of error set at 0.03, the minimum returned sample size is 55. When using Cochran's formula and setting the t = 1.96, s = 1.167[7], and the margin of error set at 0.05, the required returned sample size is 43. Based on the required samples calculated by using the two different margins of error, the final sample size was rounded to 50.

After determining the sample size needed for the study, the geographic locations of each of the pharmacies in the study population were identified. The pharmacies involved in the UW SOP ELP are grouped into one of the six hubs that are geographically dispersed throughout the state: Eau Claire, Green Bay, La Crosse, Madison, Milwaukee, and Wausau. Preceptors and other pharmacists in these pharmacies know and talk with each other due to their geographic proximity and joint involvement in the UW SOP ELP. Thus, there is a potential for pharmacists at these pharmacies to talk with each other about the study. To minimize the potential for contamination, pharmacies were grouped into three geographic regions and data collection was carried out in three successive waves, one region at a time. Two of the geographic regions correspond to the two largest hubs, Madison and Milwaukee. The third geographic region is comprised of pharmacies in the rest of the state. The Milwaukee region's data were collected in Wave 1. Data collection for Wave 2 involved

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[7] s was determined by taking the number of points on the scale for the dependent measure (= 7) and dividing by the number of standard deviations (= 6) that capture 98% of all responses.

pharmacies not in Milwaukee or Madison. Wave 3 data were collected from the Madison region. Each wave of data collection was planned to coincide with the timing of a specific clerkship block (i.e., rotation) in the fourth (final) year of the professional pharmacy program. This was to allow pharmacy clerkship students who were at a pharmacy to participate in the pharmacy, if they chose to do so.

After geographic regions were established, pharmacies were stratified based on the ownership category; ownership categories consisted of independent, health-system and corporate chain ownership. This was to achieve proportionate representation of ownership across the sample and within geographic regions. To determine the number of sites needed from each stratum, the proporation that each pharmacy ownership category represented in the sampling frame was determined (independents = 0.324, health-system = 0.297 and corporate chain = 0.378) and then multiplied by the sample size required. The three equations below show the calculations for each ownership category:

Independents: 0.324 * 50 = 16 independent owned pharmacies

Health-System: 0.297 * 50 = 15 health-system owned pharmacies

Corporate Chains: 0.378 * 50 = 19 corporate chain pharmacies

Next, the number of pharmacies needed by ownership type, within each geographic stratum was calculated. An example of the calculations is provided below for Wave 1.[8]

Independently-owned pharmacies

$$\frac{\text{5 Independents in Wave 1}}{\text{36 Independents in Population}} \times \text{16 Independents total} = \text{2 Independents Wave 1}$$

[8] Geographic regions will be referred to by Wave 1, 2 or 3 for the rest of this discussion. Wave 1 = Milwaukee, Wave 2 = all others, and Wave 3 = Madison.

Health-system owned pharmacies

8 Health-systems in Wave 1 x 15 Health-systems total = 4 Health-systems Wave 1
33 Health Systems in Population

Corporate chain pharmacies

6 Corporate Chains in Wave 1 x 19 Corporate chains total = 3 Corporate chains Wave 1
42 Corporate Chains in Population

Each pharmacy (i.e., individual outlet) was listed alphabetically by ownership category within each data collection wave. Individual pharmacies then were selected from each stratum based on systematic random sampling with a random start. A "1 in 2" sampling fraction was used for each stratum. Using this approach reduces the potential problems that might occur (e.g., selecting all pharmacies from one corporate chain and none from another chain) if simple random sampling is used (Churchill, 1995; Dillman, 2000; Trochim, 2001). A list order was then created. Table 3-1 shows the breakdown of pharmacies by ownership category for the sampling frame and the number of pharmacies sampled by data collection wave. The table presents the total number of pharmacies by ownership category within each wave. It then presents the number and percent of pharmacies sampled by ownership within each wave.

While completing the telephone interviews with the pharmacy managers, I learned that eight pharmacies that had been classified as independently-owned pharmacies were, in fact, health-system owned pharmacies. This misclassification occurred for two reasons: several pharmacies recently had been purchased by a major health-system and several others had retained their original names after previously being purchased by health-systems.

Table 3-1: Study Population Stratification and Sampling[a]

		Wave			
Ownership		**1**	**2**	**3**	**Total**
Independent	Total Number	5	18	13	36
	Number Sampled	2	7	6	15
	% Sampled	40	39	46	42
**Health-System **	Total Number	8	7	18	33
	Number Sampled	4	3	8	15
	% Sampled	50	43	44	45
Corporate Chain	Total Number	6	20	16	42
	Number Sampled	3	9	8	20
	% Sampled	50	45	50	48
Total	Total Number	19	45	47	111
	Number Sampled	9	19	22	50
	% Sampled	47	42	47	45

[a] Based on original ownership classifications

Thus, final classification resulted in the sampling frame as follows: 28 (25.2%) independent pharmacies, 41 (36.9%) health-system pharmacies and 42 (37.8%) corporate chain pharmacies.

Table 3-2 presents the original breakdown of the sampling frame, the revised sampling frame, reflecting updated ownership information, and the number of pharmacies participating by ownership type. After the correction based on ownership, the sample still reflected the population of pharmacies involved in the UW SOP ELP. In the initial sampling frame, health-system pharmacies made up the smallest percentage of pharmacies involved in the UW SOP ELP. After revision of the sampling frame, health-system owned pharmacies were almost equal in percentage to the corporate chain pharmacies involved in the UW SOP ELP.

Also, individual pharmacies were sampled, which allowed for multiple pharmacies from a given corporation/organization to be included in the sample. Pharmacies in the sample represented 25 separate organizations, with the number of pharmacies owned by a single organization ranging from 1 to 4.

DATA COLLECTION PROCEDURES

Human Subjects Approval

In January 2002, the University of Wisconsin Health Sciences Center Human Subjects Review Committee granted permission to conduct the study. Included in this permission was approval of consent procedures for telephone interviews with pharmacy managers and for follow-up surveys sent to the pharmacy managers and the professional pharmacy staff for the pilot and main study. Professional pharmacy staff included the staff

Table 3-2: Comparison of Original and Revised Sampling Frame and Participation Rates by Ownership

	Sampling Frame		
Ownership	**Initial Classification n (%)**	**Revised Classification n (%)**	**Participation Rate n (%)**
Independent	36 (32.4)	28 (25.2)	13 (26.0)
Health-System	33 (29.8)	41 (36.9)	20 (40.0)
Corporate Chain	42 (37.8)	42 (37.8)	17 (34.0)
Total	111 (100)	111 (100)	50 (100)

pharmacists, pharmacy residents, and pharmacy interns.[9] All subjects were provided a study description and an opt-out postcard (Appendix A). The study description detailed the study's purpose, what participation in the study involved, and what to do if they did not want to participate in the study. Each opt-out postcard contained an ID number to allow for tracking responses, replacement of pharmacies that opted out of the study, and linkage/aggregation of data related to a specific pharmacy.

Data Collection Process and Timeline

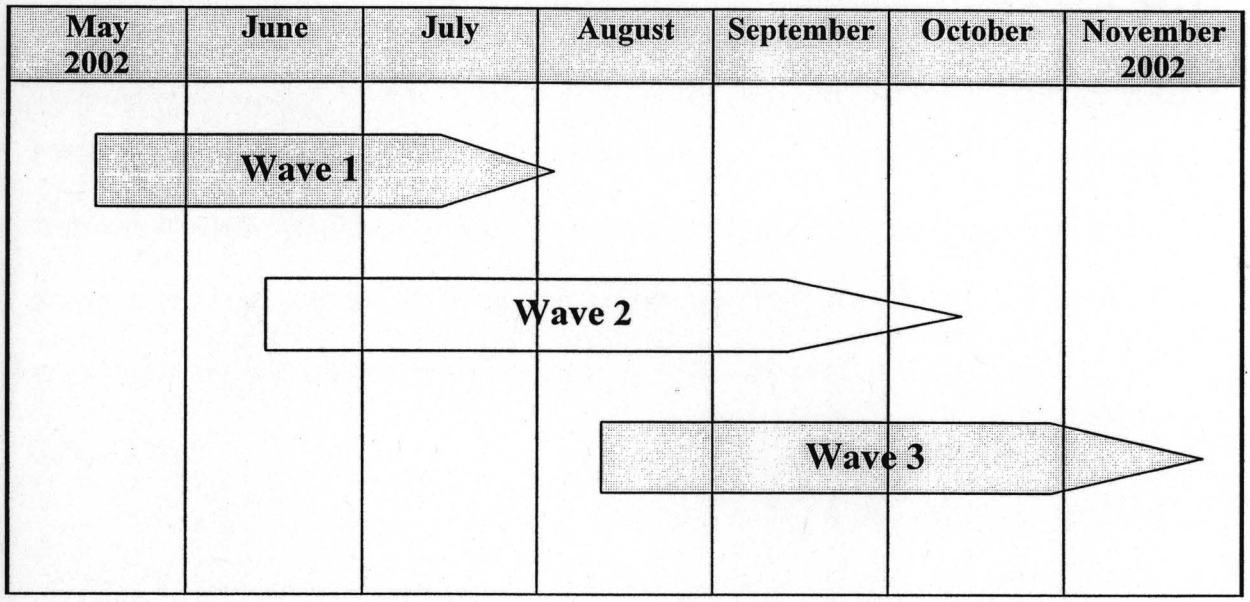
Data collection took place in two stages in each of the three waves. As described above, within the nine strata, pharmacies were listed in alphabetical order. Contact order was determined for each stratum using a random start with "1 in 2" sampling fraction to assign numbers.

Pharmacy managers were contacted by mail and follow-up phone call and asked to participate in the study. Pharmacies whose pharmacy managers opted out of the study (by postcard or telephone) were replaced by the next pharmacy in the contact order for that stratum until the targeted number of pharmacies completed the interview (Stage 1 of data collection). After interviews were completed in a given wave, follow-up surveys (Stage 2) were sent to pharmacy managers, staff pharmacists, pharmacy residents and pharmacy interns working in pharmacies participating in that wave.

Data collection occurred between May 15, 2002 and November 15, 2002. Figure 3-1 shows the overall time frame for data collection. Clerkship rotations began on May 20,

[9] Pharmacy interns are pharmacy students working in pharmacies after successful completion of the second year of the professional pharmacy program and/or pharmacy students completing their clerkship rotations in their fourth and final year of the professional curriculum.

Figure 3-1: Data Collection Timeline



July 8, and September 9 with data collection for each wave tied to the beginning of a clerkship rotation to ensure that pharmacy interns had an opportunity to participate in the study. All pharmacy managers within a given wave were contacted within an approximately 8-week time frame, with initial contact occurring two to four weeks prior to the beginning of the rotation. Data collection in Wave 2 took the longest to complete due to pharmacy managers and staff pharmacists being away on vacation during this time. As a result, there was some delay in completing the telephone interviews and surveys for this wave.

Recruitment

Pharmacy managers were mailed a "Pharmacy Recruitment Packet" (Appendix A), including an introductory letter, the study description and an opt-out postcard. A "Letter of Support" signed by the Dean of the UW School of Pharmacy was included in the "Pharmacy Recruitment Packet" for Waves 2 and 3. Upon contacting the pharmacy managers by telephone, a script was used to obtain verbal consent prior to completing the telephone interview (Appendix B).

After completion of the telephone interview, packets were sent to pharmacy managers and members of the professional pharmacy staff (pharmacists, residents, and interns) at pharmacies whose pharmacy manager completed the telephone interview. Each pharmacy manager received a "Pharmacy Manager Packet" and each professional staff member received a "Pharmacist Packet" which included a cover letter, a study description, an opt-out postcard and either the Pharmacy Manager Questionnaire (Appendix C) or the Pharmacist Questionnaire (Appendix D). An ID number was written on the opt-out postcard and the surveys to allow for tracking of responses, follow-up, and data aggregation.. All subjects

were informed that by completing and returning the questionnaire they were consenting to participate in the study.

DATA COLLECTION

The study was conducted in two stages. Initial contact and follow-up was done using a modification of methods outlined in Dillman (2000) and proceeded in the following manner. As discussed in "Sample Size and Sampling," the community and ambulatory pharmacies involved in the UW SOP ELP were grouped based on geographic regions and stratified by ownership category. Data then were collected in three waves, starting with Wave 1 and timed to correspond to the beginning of a clerkship rotation for the 4th (final) year pharmacy students. Data collection began on May 15, 2002 in Wave 1 and concluded on November 11, 2002 in Wave 3.

Pharmacy managers were sent the initial contact letter approximately four weeks prior to the beginning of a clerkship rotation, with the exception of Wave 1. In Wave 1, a shorter time period was used; letters were sent approximately 5 days prior to the beginning of the first clerkship rotation, due to delays in receiving the list of pharmacy managers and Human Subjects approval.

Stage 1: Telephone Interview

The pharmacy manager of each selected pharmacy was sent a "Pharmacy Recruitment Packet" as described above. This mailing was followed by telephone contact to verify receipt of the packet and identity of the pharmacy manager, answer questions, and determine willingness to participate. If a pharmacy manager opted out of participation, the pharmacy was replaced by the next pharmacy in the contact order list for that stratum.

When a pharmacy manager agreed to participate, a time and date was scheduled for completion of the telephone interview. When completing the telephone interview (presented in Appendix B), verbal consent was obtained and documented. Completion time for interviews ranged from 25 to 60 minutes.

The pharmacy manager was identified as the key informant for each pharmacy. There are a number of rationales for using key informants to collect all or part of data related to an organization. First, because key informants are usually chosen based on the formal positions they hold within an organization, they have substantial knowledge of the core issues involving the organization (Gupta, Shaw, & Delery, 2000; Seidler, 1974). In community pharmacy, the pharmacy manager is "responsible for the professional operations of the pharmacy" per Chapter 450.09 (1) (a) of the Wisconsin Administrative Code, including following state and federal rules and regulations. Therefore, the Pharmacy Examining Board (PEB) holds the pharmacy manager responsible for any violations. Second, because the pharmacy manager is responsible for the operations of the pharmacy, he/she is the person most likely to be able to provide key structural and operational information (Seidler, 1974).

The interview contained questions related to the pharmacy site and to the pharmacy manager. Areas covered included: (1) ownership of the pharmacy and location/setting; (2) operational activities, including hours of operation, prescription volume, services provided, personnel, and staffing; (3) decision-making and administrative responsibilities; (4) demographic information about the pharmacy manager; and (5) the names of the professional pharmacy staff (pharmacists, residents and interns) at the pharmacy. Appendix B contains the complete interview instrument.

Stage 2: Follow-up Survey

The second stage of data collection gathered information from pharmacy managers and professional pharmacy staff members at participating pharmacies. After completing telephone interviews for a specific wave, copies of the "Pharmacist Manager Packet" and "Pharmacist Packet" were prepared for the pharmacy manager and professional staff members in each participating pharmacy. Each packet was addressed to a specific individual; packets for a pharmacy were bundled and sent to the pharmacy manager who was asked to distribute the packets to members of his/her staff.

Two versions of the survey, one for the pharmacy manager and one for the professional pharmacist staff were used (see Appendices C and D). Different versions of the survey were used for two reasons. First, three questions were asked of only one of the respondent groups. Pharmacy managers (only) were asked whether a plan was in place to deal with potential staff turnover while professional staff members (only) were asked if they were full- or part-time employees and if they had any administrative responsibilities. Second, some rewording was necessary to have questions make sense to the professional staff members. An example of this is from question 11 on both surveys; the pharmacy manager survey asked "Do you have…?" while the pharmacist survey asked "Do you know if your pharmacy…?"

The survey collected data from five areas. The first area concerned drug therapy management activities, ranging from activities required by state law to those that would be provided at the highest level of drug therapy management. Pharmacists were asked how important they thought each activity was and for what percentage of patients they carried out these activities. The second area related to strategic management activities, including

information regarding vision, mission and plans in the pharmacy. The third area addressed operational management of the pharmacy and included questions related to scheduling and training. Future time perspective, the fourth area covered in the survey, focused on determining how far into the future respondents thought. Lastly, socio-demographic information was collected including education, age, gender, length of time licensed, length of time at pharmacy, percent time involved in prescription processing and dispensing, full- or part-time employment, and involvement in administrative or management activities.

Questions for each of these areas were developed based on the definitions of strategic, operational, and drug therapy management. The majority of questions were framed with the *pharmacy* as the referent. For example, "Does your pharmacy have a vision statement?" Other questions were asked with the *pharmacist* as the referent (e.g., "For approximately what percentage of your patients do you actually do this task?"). After collection, data were aggregated to represent each specific pharmacy. I will return to the discussion of measures in Chapter 4.

Every effort was made to assure the highest possible response rate. As noted earlier, cover letters and instructions emphasized anonymity for individual respondents and pharmacies. In addition, two follow-up contacts were made to non-respondents. Follow-up contact was conducted via mail. A letter was sent to each non-respondent encouraging him/her to complete and return his/her survey. The letter also asked him or her to contact me if a new copy of the survey was needed. At the second follow-up contact, a replacement survey and cover letter was sent to each non-respondent. A thank you note was sent to each respondent within one week of receiving the completed survey. Appendix E provides further detail regarding the data collection process.

PRETESTING INSTRUMENTS

Pretesting of the data collection instruments is important when collecting primary data for research to insure the success of the study because it allows for the identification of problems with formatting, wording, understanding of the questions, and ordering (Churchill, 1995; DeVellis, 1991; Dillman, 2000). Data collection instruments were pretested according to the four sequential stages suggested by Dillman (2000): 1) review by knowledgeable colleagues and analysts, 2) interview to evaluate cognitive and motivational qualities, 3) small pilot study, and 4) final check.

Review by knowledgeable colleagues and analysts

The purpose of this stage of review is to finalize the content of the questionnaire so that construction of the data collection instruments can be undertaken (Dillman, 2000). The telephone interview and survey instruments were reviewed by colleagues from the UW School of Pharmacy and selected pharmacists for content coverage. Based on colleague reviews, several questions were reworded and a number of new questions were created.

Interviews to Evaluate Cognitive and Motivational Qualities

The goals of this stage are to make sure all the words are understood and questions are interpreted in a similar manner by all respondents, identify if questions have responses that can be marked (answered) by respondents, and see if specific questions were consistently skipped (Dillman, 2000). Both the concurrent think-aloud interview (Lewis, 1982) and the retrospective interview method (Dillman 2000) were used with pharmacists and interns at one pharmacy involved in the UW SOP ELP clerkship program and with several pharmacy students enrolled in the UW SOP during October and November 2001. The think-aloud interview was the first method used with respondents because it provided immediate

information and enabled clarification on specific points. When respondents had difficulty with this method, the retrospective interview method was used. After reviewing the comments from these interviews, questions and response categories were further refined.

Small Pilot Study

Pilot studies allow the researcher to test-run the data collection process (Dillman, 2000). A pilot study allows the researcher to answer such questions as:

- Are some questions generating a higher response rate?
- Are entire pages of sections of the questionnaire being skipped?
- What response rate can I expect?
- Is there confusion about content of interview or questionnaire questions?

A pilot study was conducted between January and April 2002 with a sample of 15 community and ambulatory pharmacies selected from Kane, Lake and McHenry counties in northeastern Illinois, outside of Chicago. The area was diverse with respect to population and pharmacies, not unlike the Wisconsin communities where the eligible pharmacies are located. The pilot study was conducted outside of the state of Wisconsin due to the small size and interconnectedness of Wisconsin's pharmacy community. Given the limited number of pharmacies involved in the UW SOP ELP, pilot testing the instruments in this population would decrease the pharmacies eligible for the main study. Additionally, pharmacists have contact with each other through various professional groups, and work activities, providing opportunities for them to talk with each other. Thus, using Wisconsin pharmacies not involved in the UW SOP ELP for the pilot test could have also led to contamination of the study sample. Therefore, it was deemed appropriate to conduct the pilot study outside of the state of Wisconsin.

In January 2002, letters were sent to 15 pilot study pharmacies. Pharmacy managers were mailed a "Pharmacy Recruitment Packet". Six pharmacies agreed to participate in the pilot study. Of these, five telephone interviews were completed; one pharmacy was independently owned, one was health-system owned and three were corporately-owned chain pharmacies. Response rate for the telephone interviews was 33% (5/15).

In April 2002, surveys were sent to the pharmacy manager and professional pharmacist staff members working at the pharmacies where the telephone interview portion of the study was completed. Of the fifteen surveys sent to the five pharmacies, eight (53.3%) were returned; one respondent officially opted out of the study.

Analysis of both the interview and survey instruments included checking the validity of the instrument's wording, clarity, and non-responses. With only eight respondents for the survey instrument, reliability analysis was not feasible. Based on the responses to the pilot test, questions were examined for wording changes and clarity.

Final Check

The role of the final check is to have a few people who were not involved in the construction or revision of the data collection instruments to go through the instruments and answer them completely and suggest revisions if necessary. In May 2002, several Social and Administrative Science colleagues at another school of pharmacy completed the survey and provided comments. Based on this final check, several changes were made to the survey instrument to provide clearer answers to questions and to decrease possible misinterpretation of the questions.

DATA MANAGEMENT

Two initial databases were created for the telephone interviews and the follow-up surveys. Each pharmacy was assigned a three digit code. Upon completion of a telephone interview, interview data were coded and entered into SPSS© Statistical Package for Windows, version 11.5.

Each manager and professional pharmacist staff member identified in the pharmacy manager interview was assigned a four digit code number. This number identified the individual staff member and his/her pharmacy and allowed monitoring for individual responses and follow-up. An Excel© spreadsheet was constructed and upon return of each follow-up survey, data were coded and entered into the follow-up survey database. This then was converted into an SPSS© data file.

Prior to merging the two databases to allow organizational-level analysis, data in each database were checked for keystroke and data entry errors (Churchill 1995). The databases were examined for out-of-range errors and to identify possible univariate and multivariate outliers by running frequencies and histograms.

CHAPTER 4: MEASURES AND ANALYSIS PLAN

In Chapter 3, I discussed the research setting and design used to collect data from community pharmacies involved in the UW SOP ELP. Chapter 4 now discusses construction of measures used in the study, data aggregation, and data analysis.

CONSTRUCTION OF MEASURES

Indexes versus Scales

Measures may be used to create scales or indexes. Measurement scales are "collections of items intended to reveal levels of theoretical variables, not readily observable by direct means" (DeVellis, 1991). Over the past 20 years, emphasis in research has been on the development of measurement scales almost to the exclusion of other methods of measurement (Diamantopoulos & Winklhofer, 2001). In classical scale development, scales consist of what Bollen (1989) terms "effect indicators," items whose values are caused by an underlying construct, or "latent variable" as referred to by various researchers (e.g., Anderson & Gerbing, 1982; Churchill & Peter, 1984; Danes & Mann, 1984; DeVellis, 1991). The result is that "existing measures development guidelines (e.g., DeVellis, 1991; Spector, 1992) focus almost exclusively on scale development, whereby items (i.e., observed variables) composing a scale are perceived as reflective (effect) indicators of an underlying construct (i.e., latent variable)"(Diamantopoulos & Winklhofer, 2001: 269).

The development guidelines for scales focus on the use of multi-item measures to represent the underlying constructs. The multi-item measures are then assessed for dimensionality, reliability and validity (Anderson & Gerbing, 1982; Churchill & Peter, 1984;

Danes & Mann, 1984; DeVellis, 1991). Construct validity, including convergent and discriminant validity (e.g., DeVellis, 1991; Schwab, 1999) are the dominant focus of scale development. Convergent validity is "when there is a high correspondence between scores from two or more multiple measure of the same construct" (Schwab, 1999). In contrast, discriminant validity is apparent when scores from measures of different constructs do not converge, thereby establishing that scores from a measure are uniquely related to a single construct (DeVellis, 1991; Schwab, 1999). The expectation for a good scale is that measures related to a specific construct should in fact be related to one another and only related to a single latent variable.

In contrast to measurement scales where effect indicators are caused by the latent variable (Bollen & Lennox, 1991; Bollen, 1989), index construction is made up of "cause indicators" (DeVellis, 1991) or "formative indicators" (Bollen & Lennox, 1991). Formative indicators are a composite of the latent variable (Bollen & Lennox, 1991) and are not necessarily related to each other (Diamantopoulos & Winklhofer, 2001). Thus, if a formative indicator is removed from the construct, part of the construct is omitted (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). This is in contrast to effect indicators and their use in scale development; effect indicators are only removed from a scale when doing so will not decrease the reliability and validity of the scale (e.g., DeVellis, 1991; Schwab, 1999).

Just as the rationales for removal of items are different for measurement scales and indexes, so too are processes for the development of those measures. The process used for scale development is detailed in step-by-step guides for construct specification, item selection and purification, and scale validation (e.g., Churchill & Peter, 1984; DeVellis, 1991; Spector, 1992). The process is somewhat different for index construction and

guidelines are much more difficult to find. Diamantopoulos and Winklhofer (2001), after a thorough search of the literature, identified several issues that are critical to successful index construction: content specification, indicator specification, and external validity. Content specification involves establishing the scope of the latent variable that the index is intended to capture (Diamantopoulos & Winklhofer, 2001). This is important because too narrow a scope may result in failure to consider all facets of the construct and lead to the exclusion of relevant indicators, thereby excluding part of the construct itself (Diamantopoulos & Winklhofer, 2001; Nunnally & Bernstein, 1994). Indicator specification is linked to content specification as the items used as indicators must cover the entire scope of the latent variable as defined under the content specification stage. Validity is also an issue in index construction. Whereas in scale construction various forms of validity are assessed, in index construction, only external validity is assessed (Diamantopoulos & Winklhofer, 2001). The goal of index construction is to identify indicators that are meaningful, interpretable, important and common enough to yield results so as to produce variability in the responses.

In summary, latent variables may be measured using scales or indexes. The process and focus of each of these methods differs from each other. Whereas scale items should be related to each other and reflect the latent variable, index items do not need to be related to each other as they are activities that influence the latent variable.

Measures and Their Construction

In light of the above measurement-related issues, measures were developed for the three dependent variables, Strategic Management Index (SMI), Operational Management Index (OMI) and Drug Therapy Management (DTMI). The independent variable, Future Time Perspective (FTP) was measured using a previously developed measure. Three control

variables were also included in the operationalized research model: ownership, workload, pharmacist intensity (See Figure 2-5). In this section, I will discuss each variable and how it was measured.

Strategic Management Index

In developing the strategic management index, I examined the strategic management literature and concurred with Boyd and Reuning-Elliott's (1998) critique concerning the lack of consistent operationalization of strategy constructs. In the pharmacy literature, there has been little systematic analysis of strategic planning and management; much of this literature is application based. While the study by Doucette and Koch (2000) discussed earlier found that "futurity of decisions" was an important factor in pharmacies having changed to a drug therapy model of practice , the balance of the pharmacy literature focuses on the benefits of strategic management and application of strategic management concepts to pharmacy practice organizations (e.g., Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002; Holland & Nimmo, 1999a,1999c; Nimmo & Holland, 1999b-a,1999d,2000; Rovers, 2003).

Given the paucity of guiding research, the steps to develop the measure included examining the strategic management and pharmacy literature and consulting with colleagues. The strategic management literature identifies vision, mission and planning as three of the core elements of the strategic management process (e.g., Daft, 1991; Finlay, 2000; Griffin, 1990; Rea & Kerzner, 1997). The pharmacy literature also recognized development of a vision statement, mission statement, and plan as necessary to the provision of drug therapy management (Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002). After assessing the literature and conferring with colleagues, a measure was developed to examine the pharmacist's awareness and knowledge of the pharmacy's vision, mission, and plan.

The Strategic Management Index (SMI) is a composite of activities related to planning in the pharmacy: vision, mission and plan (See Table 4-1). For each of these activities screening and follow-up questions are considered. Each screening question was phrased as "Does your pharmacy have…" with responses of "no", "don't know" and "yes". For Vision and Mission, the follow-up questions asked respondents about their familiarity with the pharmacy's vision and mission statements. The follow-up question for Plan asked "how far into the future the plan looks."

Prior to creating the sum score for the SMI, the relationship between the Vision and Mission measures was examined was examined at the individual level of analysis (rather than the organizational level). There were two reasons for examining this correlation: (1) some researchers and writers on strategy combine these two concepts into one measure where others believe they are distinct concepts and (2) several respondents wrote that they thought about vision and mission as a single concept. (Respondents in the pilot test had not provided similar comments.) Both the Pearson r and the Spearman rho correlations were significant (Pearson = 0.73, $p = 0.01$; Spearman = 0.77, $p = 0.01$). Though there is a significant correlation between these two measures, the correlation is not perfect (i.e., 1.0). If there had been a perfect correlation between these two measures, it would have been feasible to drop one of the measures. Due to the high correlation, it was deemed appropriate to have the Plan measure equal to the sum of the Vision and Mission measures. This would decrease potential over-representation in the index by the Vision and Mission measures.

The raw scores for individual measures that constituted an index (i.e., SMI, Organizing, Implementing and Controlling) were converted so that each index had a

Table 4-1: Strategic Management Index

Measure	Question	Coding	Scoring
Vision	**Screen:** Does you pharmacy have a vision statement?	No = 0 Don't know = 1 Yes = 2	• Screen and Follow-up scores were added together to create the Vision score. • Vision score was multiplied by 4.5 • Score range = 0 – 22.5
	Follow-up: How familiar are you with its content?	Screen of 0 or 1 = 0 Not familiar = 1 Somewhat familiar = 2 Very familiar = 3	
Mission	**Screen:** Does your pharmacy have a mission statement?	No = 0 Don't know = 1 Yes = 2	• Screen and Follow-up scores were added together to create the Mission score. • Mission score was multiplied by 4.5 • Score range = 0 – 22.5
	Follow-up: How familiar are you with its content?	Logical skip = 0 Not familiar = 1 Somewhat familiar = 2 Very familiar = 3	
Plan	**Screen:** Does your pharmacy have a formal plan for the future?	No = 0 Don't know = 1 Yes = 2	• Screen and Follow-up scores were added together to create the Plan score. • Plan score was multiplied by 9 • Score range = 0 - 45
	Follow-up: How far into the future does the plan look?	Logical skip = 0 1 year = 1 2 years = 2 3 or more years = 3	
SMI = (Vision * 4.5) + (Mission * 4.5) + (Plan * 9). Possible range = 0 – 90 Mean = 48.3 (s.d. = 25.63)			

maximum score of 90, the same as what will be discussed for the drug therapy management index. The Vision and Mission scores were each multiplied by 4.5; giving each component a possible score range of 0 to 22.5. The Plan score was multiplied by 9.0; giving a possible range of 0 to 45. The final SMI score had a possible range of 0 to 90 at the individual-level of analysis (n = 82), with a mean score of 48.3 (s.d. = 25.6).

The scores on the individual SMI measures show an interesting pattern (see Table 4-2). The Vision and Mission measures have basically the same mean (15.6 and 15.5 out of 22.5, respectively), therefore, pharmacists have a similar awareness of both of these statements. For the Plan measure the mean is 17.2 (out of 45.0) with a standard deviation of 16.4. The awareness of a plan for the pharmacy is lower than the Vision and Mission measure.

Modifications will also be seen with the Operational Management Index. These will be discussed in the following sections. Aggregated (i.e., organizational-level) results for the SMI will be presented in Chapter 5.

Operational Management Index

In Chapter 2, I discussed the three functions that comprised operational management: organizing, implementing and controlling. To develop the Operational Management Index (OMI), I examined the management literature for possible measures and found no specific measures that fit with the concepts of organizing, implementing and controlling. Next, I examined the pharmacy literature for potential measures related to these three functions. Few empirical studies done in pharmacy have examined any of the operational management concepts, though various applied articles and books describe management activities and ways to manage a pharmacy to provide services related to drug therapy management

Table 4-2: Strategic Management and Operational Management Measures – Means, Standard Deviations and Ranges (n = 82)

Index	Mean	S.D.	Range[a]
Strategic Management Index	**48.4**	**25.6**	**0.0 – 90.0**
Vision	15.6	7.4	0.0 – 22.5
Mission	15.5	7.6	0.0 – 22.5
Plan	17.2	16.4	0.0 – 45.0
Operational Management Index	**141.0**	**43.3**	**58.0 – 223.0**
Organizing Index	**52.5**	**19.2**	**0.0 – 90.0**
Schedule Period	17.6	9.4	0.0 – 30.0
Schedule Posted	20.5	8.7	0.0 – 30.0
Drug Information Database	14.4	13.4	0.0 – 30.0
Implementing Index	**48.7**	**29.8**	**0.0 – 90.0**
Pharmacist Training	13.9	13.1	0.0 – 30.0
Technician Training	14.8	13.6	0.0 – 30.0
Skill Development Reimbursement	20.0	11.8	0.0 – 30.0
Controlling Index	**39.8**	**16.1**	**8.0 – 78.0**
Performance Review	17.3	5.3	0.0 – 30.0
QA/QI Program	6.8	8.1	0.0 – 30.0
Financial Control	15.7	9.4	0.0 – 30.0

[a] Observed ranges for measures

(Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002; Holland & Nimmo, 1999a,1999c; Nimmo & Holland, 1999b-a,1999d; 2000).

Since no specific measures were identified in the literature, definitions and concepts in the management and pharmacy literatures were the starting point for development of the organizing, implementing and controlling measures. First, definitions of organizing, implementing and controlling were identified. This was followed by examination of the pharmacy literature and identification of concepts and activities that corresponded to the definitions of organizing, implementing and controlling. Input from colleagues was obtained to help determine which activities belonged with a specific concept. Methods outlined by Dillman (2000) were used to refine the items.

Final scores for each of the functional indexes (i.e., organizing, implementing, and controlling) were standardized to a common metric with a range of 0 to 90, this allowed for comparisons across the functional indexes and between the operational and strategic management indexes. In the following section, I will describe the functional indexes and the overall operational management index at the individual-level of analysis. Aggregated results of the Operational Management Index will be presented in Chapter 5.

Organizing Index is based on activities related to the organizing function of a manager, as discussed in Chapter 2. Organizing is defined as the "deployment of organizational resources to achieve strategic objectives" (Daft, 1991: 245). Stated another way, organizing is the function of allocating resources to allow the organization to reach its goals. Necessary resources in community pharmacies are personnel and information databases. Of the three measures identified, two measures are related to staff scheduling issues. One addresses the time period of the staffing schedule, that is, what time frame is

covered by the schedule; the other addresses how far in advance the staffing schedule is posted. The third measure was concerned with how frequently the pharmacy's drug information database is updated. This is essential to understanding the continuous changes in drug information for existing medications and the availability of new medications. Table 4-3 presents the measures, coding and scoring of the Organizing Index.

Scheduling measures were coded 0 to 5 and the drug information measure was scored 0 to 6. After assessing the distributions, the three measures were recoded on a scale of 0 to 2 to allow for scaling to a common metric to occur and to address distributional issues. Then each of the three measures was multiplied by 15 to create a sum score range for the index of 0 to 90. The mean for 82 respondents is 52.5 (s.d. = 19.2). Means for the individual measures (out of a possible score of 30) from lowest to highest were: Drug Information Database mean = 14.4 (s.d. 13.4), Schedule Period mean = 17.6 (s.d. 9.37) and Schedule Posted mean = 20.5 (s.d. = 8.7).

Implementing Index is based on activities related to the implementing function of a manager as discussed in Chapter 2. Griffin (1990: 10) describes this function the "processes used by members of the organization to work together to further the interests of the organizations." Stated another way, implementing is concerned with the processes in place to help members of the organization work together to help the organization achieve its goals. Processes identified as necessary to helping members of a pharmacy work together to achieve organizational goals include training and skill development. Three measures were

Table 4-3: Organizing Index

Measure	Question	Original Coding	Revised Coding	Scoring
Schedule Period[a]	What period of time is covered by the schedule?	Less than 1 week = 0 1 week = 1 2 weeks = 2 3 weeks = 3 4 weeks = 4 Other = 5	Less than 4 weeks = 0 4 weeks = 1 > 4 weeks = 2	• Coding was revised based on frequency distribution to facilitate the use of a common metric. • Score was multiplied by 15 • Score range = 0 – 30
Schedule Posted[a]	How far in advance is the scheduled posted?	Less than 1 week = 0 1 to 2 weeks = 1 3 to 4 weeks = 2 1 to 2 months = 3 More than 2 months = 4 Other = 5	Less than 1 week = 0 1 to 2 weeks = 1 ≥ 3 weeks = 2	• Coding was revised based on frequency distribution to facilitate the use of a common metric. • Score was multiplied by 15 • Score range = 0 – 30
Drug Information Database Update	How frequently does your pharmacy update the drug information database?	Don't know/not sure = 0 Monthly = 1 Bimonthly – 2 Quarterly = 3 Semi-Annually = 4 Yearly = 5 Other = 6	Don't know/not sure = 0 Bimonthly or less frequently = 1 Monthly or more frequently = 2	• Coding was revised based on frequency distribution and the frequency at which the DI database was updated. • Score was multiplied by 15 • Score range = 0 - 30
Organizing Index = (Schedule period * 15) + (Schedule posted * 15) + (Update DI Database * 15). Possible range = 0 – 90 Mean = 52.5 (s.d. = 19.2)				

[a] Schedule refers to staffing schedule.

developed from the two processes identified. Two measures focused on training; training of pharmacists and training of technicians. The third measure focused on the organizations' willingness to reimburse for costs of skill development of its staff.

Table 4-4 provides the questions, original and revised coding and scoring of the Implementing Index. For each of these activities screening and follow-up question were used. The screen for the pharmacist and technician training questions asked "How are (pharmacists/technicians) trained at your pharmacy?" There were five response categories ranging from "nothing specific" to a combination of formal and informal training. The follow-up for both of these questions asked about the length of training in weeks, ranging from less than 1 week to 4 weeks. The skill development screen asked if their pharmacy reimbursed for the acquisition of new skills. The follow-up question provided a list of programs that might be reimbursed for and asked the respondent to check all that applied. After examining the frequency distribution of the measures coding was revised to allow for establishment of a common metric. Each of the three measures had a possible score range of 0 to 30, with the Implementing Index having a possible score range of 0 to 90. For the 82 respondents, the mean for the Implementing Index is 48.7 (s.d. = 29.8).

Table 4-2 presents the means and standard deviations for the individual measures constituting the Implementing Index. Skill development reimbursement has a mean of 20.0 (s.d. = 11.8). Pharmacist Training has a mean score of 13.9 (s.d. = 13.1) and Technician Training as a mean score of 14.8 (s.d. = 13.6). All three measures have large standard deviations suggesting that there is variation in the type and length of training and skill development support that occurs in community pharmacies. It is interesting that pharmacy technicians receive more training than pharmacists. This may be because pharmacist receive

Table 4-4: Implementing Index

Measure	Question	Original Coding	Revised Coding	Scoring
Pharmacist Training	**Screen:** How are pharmacists trained at your pharmacy?	Nothing specific, just jump right in = 1 Informal training only = 2 Formal orientation = 3 Formal training = 4 Both formal and informal training = 5	Informal training = 0 Formal orientation or training = 1	• Coding was collapsed based on frequency distribution. • Score was multiplied by 10. • Score range = 0 – 30
	Follow-up: What is the length of time of the formal training period?	Less than 1 week = 0 1 week = 1 2 weeks = 2 3 weeks = 3 4 weeks = 4 Other = 5	1 week or less = 0 2 weeks = 1 > 2 weeks = 2	
Technician Training	**Screen:** How are pharmacists trained at your pharmacy?	Nothing specific, just jump right in = 1 Informal training only = 2 Formal orientation = 3 Formal training = 4 Both formal and informal training = 5	Informal training = 0 Formal orientation or training = 1	• Coding was collapsed based on frequency distribution. • Score was multiplied by 10. • Score range = 0 – 30
	Follow-up: What is the length of time of the formal training period?	Less than 1 week = 0 1 week = 1 2 weeks = 2 3 weeks = 3 4 weeks = 4 Other = 5	1 week or less = 0 2 weeks = 1 > 2 weeks = 2	

Table 4-4: Implementing Index Continued

Measure	Question	Original Coding	Revised Coding	Scoring
Skill Reimbursement	**Screen:** Does your pharmacy reimburse expenses for staff to acquire new skills and competencies such as BPS certification, technician certification, disease state management training?	My pharmacy does not reimburse for additional training = 0 Don't know = 1 Yes, reimburses = 2	Does not/don't know = 0 Yes, reimburses = 1	• Coding was revised based on frequency distribution. • Score was multiplied by 10 • Score range = 0 - 30
	Follow-up: My pharmacy reimburses expenses for the following (Check all that apply):	All reimbursed expenses related to skill or competency acquisition were identified.	If technician certification or 1 pharmacist type of skill/certification = 0 2 or more pharmacist skills/certifications = 1 Technician certification and 2 or more pharmacist skills/certifications = 2	
Implementing Index = (Pharmacist training * 10) + (Technician training * 10) + (Skill reimbursement * 10) Possible score range = 0 – 90 Mean = 48.7 (s.d. = 29.8)				

their professional training in through a formalized educational process and therefore only require training-related activities and processes in the pharmacy. In contrast, technicians are not required to go through a formalized degree-granting educational process and therefore, training occurs within the pharmacy and/or the larger organization.

Controlling Index is based on activities related to the control function of a manager discussed in Chapter 2. Griffin (1990: 597) defines control as "the regulations of one or more organizational activity in such a way as to facilitate goal attainment." Stated another way, control is the systematic process used to evaluate organizational activities against expectations established by the organization's plans, targets, and performance standards (Daft, 1991). There are several steps in the control process outlined by Daft (1991); these include the establishment of standards, measuring actual performance, comparison of performance to standards and taking corrective action. Measures identified in the business literature are related to specific areas of control and their effect on firm performance, such as human resource management (Gelade & Ivery, 2003; Huang, 2001) and financial control (Draman, Lockamy, & Cox, 2002).

In a search of the pharmacy literature, no specific measures were found related to the concept of control. Therefore, three measures of control were developed using the definition of controlling and input from pharmacy colleagues. One focused on staff performance reviews, one on the presence or absence of a quality assessment/quality improvement program, and the third focused on a measure of financial control. Table 4-5 presents the measures, coding and scoring for the Controlling Index. The performance review question was the only measure with a screen and follow-up. The screen was used to differentiate those sites that

Table 4-5: Controlling Index

Measure	Question	Original Coding	Revised Coding	Scoring
Performance Review	**Screen:** Does your pharmacy utilize a formal performance review process to evaluate staff members?	No = 0 Don't know = 1 Yes = 2	No change	• Screen and follow-up added together. • Score was multiplied by 6 • Score range = 0 – 30
	Follow-up: How often are reviews conducted? (open-ended).	Answers ranged from: • Annually • 90 day review and annually • Semi-annually or more frequently	Annually = 1 90 day review and annually = 2 Semi-annually or more frequently = 3	
Quality Assessment/ Quality Improvement	Does your pharmacy have a quality assessment/ quality improvement program?	No = 0 Don't know = 1 Yes, informal program = 2 Yes, formal program = 3	No change	• Score was multiplied by 10 • Score range = 0 – 30
Financial Control	How frequently do you systematically review the following financial aspects of your pharmacy? a. Payroll b. Third Party c. Net Profit d. Gross Margin % e. Inventory $$	Daily = 1 Weekly = 2 Monthly = 3 Quarterly = 4 Semi-Annually = 5 Annually = 6	Not applicable/ don't know = 0 Quarterly or less frequently = 1 Monthly = 2 Weekly or more frequently = 3	• Coding was revised based on frequency distribution. • Items were summed. • Sum score was multiplied by 2 • Score range = 0 - 30
Controlling Index = (Performance Review * 6) + (QA/QI * 10) + (Financial Control * 2) Possible Score = 0 – 90 Mean = 39.8 (s.d. = 16.1)				

provided performance reviews from those that did not. The follow-up question was open-ended and asked how frequently reviews were conducted. The question related to quality assessment/quality improvement used to measure the presence or absence of a program. Lastly, the financial control measure asked respondents to describe how frequently they reviewed specific financial information related to the pharmacy's performance. Recoding was done to facilitate placing the measures on a common metric. The possible range for each measure was 0 – 30. The possible range for the Controlling Index was 0 – 90 and the mean index score was 39.8 (s.d. = 16.1) for the 82 respondents. Table 4-2 presents the means and standard deviations for the individual measures constituting the Controlling Index.

Operational Management Index (OMI) is created by summing the scores of the Organizing Index, the Implementing Index, and the Controlling Index to represent the activities involved in the daily operations of a community pharmacy. The possible range for the OMI sum score is 0 to 270. Table 4-2 presents the mean and standard deviation the Operational Management Index. The mean for the Operational Management Index is 141.0 (s.d. = 43.3).

Drug Therapy Management Index

Research examining the activities of pharmacists has focused primarily on specific activities (e.g., patient consultation, drug utilization review) within pharmacy practice. Several measures have been developed to assess pharmacists' drug therapy management activities. Odedina and colleagues (Odedina & Segal, 1996b; Odedina, Segal, Hepler et al., 1996a) developed and validated the *Behavioral Pharmaceutical Care Scale (BPCS)* for measuring pharmacists' activities. Fourteen domains were identified through the use of 36 items: documentation, patient assessment, implementation of therapeutic objectives and

monitoring plans, patient record screening, patient advising/counseling, patient understanding verification, referral/consultation, counseling location, filled prescription validation, information support, patient satisfaction evaluation, competency improvement, performance evaluation, and provision of medical information (Odedina, Segal, Hepler et al., 1996a). These 14 domains cover the range of activities in community pharmacy practice.

The BPCS was not utilized in this study for two reasons. First, seven of the domains were each measured using single items. There is a possibility that single item measures may not accurately measure the construct of interest, thus, decreasing the validity of the measure. Second, the frame of reference across the scale was not consistent; it ranged from the use of "the last five patients", to "all patients with chronic conditions for the last six weeks", to "the last two weeks" (Odedina et.al, 1996b:864). Changes in frame of reference could confuse the respondents. Several other measures were also available and were investigated for their use in the study.

Farris and Schopflocher (1999) examined the community pharmacists' intention and behavior related to the provision of pharmaceutical care. Two separate surveys were used in this study. The first measured attitudes and intentions and the other measured behaviors. The frame of reference across both surveys was consistent with the reference being "one patient" (Farris and Schopflocher 1999:58-59). In examining these measures, I focused on the behavior items as behavior is the focus of the current study. The 20 items used by Farris and Schopflocher (1999) were factor analyzed and resulted in three factors: novel activities, traditional activities, and documentation. The items within each factor were summed for the five facets (self-efficacy, beliefs, evaluation, behavioral control and behavior) for which alpha reliabilities were calculated. The reliability for the novel activities scale ranged from

0.73 to 0.95. The reliability for the traditional activities scale ranged from 0.51 to 0.93, and the reliability for the documentation activities ranged from 0.74 to 0.93.

These 20 items used by Farris and Schopflocher are similar in content to the 18 items developed by Van der Veen (1999). Whereas Farris and Schopflocher (1999) focused the pharmacist's response on a single patient, Van der Veen (1999) asked pharmacists what percentage of all patients they provided individual activities. The scales developed by Farris and Schopflocher (1999) and Van der Veen (1999) had reliabilities greater than 0.7 for the subscales. With both sets of "pharmaceutical care" scales having good reliability, I chose to use Van der Veen's (1999) measure as I would be aggregating data to the pharmacy level. Using a response category based on percentage of patients for whom a pharmacist performed a specific activity was more suited to organizational level analysis than focusing on behavior related to one patient.

In his study, Van der Veen (1999) had identified *a priori,* four pharmacy practice models: traditional, enhanced patient counseling, generalized pharmaceutical care and disease state management. Traditional pharmacy practice was defined by the activities that are required by law for the dispensing of a prescription. Van der Veen (1999) describes the traditional model as one that is product-focused, where pharmacists are focused on procurement, storage and dispensing of drugs. Enhanced patient counseling, generalized pharmaceutical care and disease state management models in are three of the five patient-oriented models of pharmacy practice identified by Rovers and Bajcar (2002) The enhanced patient counseling model is the simplest form of patient care activities; the pharmacist serves as the drug expert in providing information to patients concerning their medications. This approximates the clinical pharmacy model as defined by Rovers and Bajcar (2002)). In this

model, "consumers" begin to be viewed as "patients" by pharmacy practitioners, though much of the information provided by the pharmacist is product-focused and might not take into account patient idiosyncrasies. Generalized pharmaceutical care focuses on the care of the patient, with pharmacists accepting responsibility for the care and outcomes of their patients. In contrast, disease state management is a comprehensive approach to the preventions and treatment of diseases that: "1) targets patients with specific diseases; 2) provides integrated services across organizational and professional boundaries; 3) utilizes services based on the best scientific evidence available; and 4) focuses on outcomes" (Van der Veen, 1999: 9).

Van der Veen (1999) had originally proposed that the pharmacy practice models would occur in successive order, most notably that if a pharmacist was performing disease state management he/she would also be doing the activities related to the other three practice models. Results from Van der Veen's (1999) study show that three of the models, traditional, enhanced patient counseling and generalized pharmaceutical care relate in this manner. Disease state management was shown to be practiced by those providing both enhanced patient counseling and generalized pharmaceutical care. In fact, in discussing pharmaceutical care, Cipolle, Strand, Morley and Perrier (1991) talk about levels of pharmaceutical care and acknowledge that not all patients require the highest level of pharmaceutical care. Whereas, pharmaceutical care and disease state management have tried to disassociate pharmacists from the dispensing of the prescription product (Galt & Narducci, 1997), integrated pharmaceutical care services and total pharmacy care (Rovers & Bajcar, 2002) include both patient care and drug distribution as necessary functions of patient-oriented pharmacy practice models. Drug therapy management is a combination of

functions, such as drug product distribution, drug information, and patient-care services (both individual and disease management based) related to the provision of patient care. Van der Veen's results show that pharmacists are providing selected activities related to drug therapy management, this could be because that is all that their patients require.

The Drug Therapy Management Index (DTMI) consisted of the original measure (18 items) developed by Van der Veen (1999). For this study, the original question asking about counseling was broken into two separate questions, one asking about counseling on new prescriptions and the other about counseling on the first refill of a prescription. The rational for creating two questions is that state laws vary with some only requiring pharmacists to counsel on new prescriptions and others requiring pharmacists to counsel on new and refill prescriptions (NABP, 2002) An additional item was added to reflect pharmacists' behaviors in regard to providing assistance to patients with complex regimens such as providing compliance aids (e.g. memory boxes, calendars, etc.). Collectively, these activities ranged along a continuum from those required by the state pharmacy practice laws and rules (thus establishing the minimum standards of practice) and those that reflect a relationship-based patient-focused model of practice.

After final refinement of the index, only items related to activities in Van der Veen's models of enhanced patient counseling, generalized pharmaceutical care, and disease state management were analyzed. Items related to traditional pharmacy activities were dropped. The rationale for this was that these activities are required by law as established by Chapter Phar 7 in the Wisconsin Administrative Code. Because all pharmacies must adhere to these standards, they show little variability across pharmacies. Removing these items from the

data analysis provided a clearer picture of the specific drug therapy management activities being performed.

The content coding, means and standard deviations for the fifteen items retained in the Drug Therapy Management Index are presented in Table 4-6. Means and standard deviations of the original items from Van der Veen's study also are presented for comparison. The activities in the Drug Therapy Management Index are grouped together based on the original models developed by Van der Veen (1999). The first seven items are related to what Van der Veen (1999) termed 'enhanced patient counseling.' The next 6 activities correspond to Van der Veen's (1999) model of 'generalized pharmaceutical care.' The last two activities are related to the 'disease state management' model. The Cronbach's alpha for the 15-item index is 0.89 based on 82 respondents. The possible score range is 0 to 90.

The five activities with the highest means are the first five activities presented in the table (1 through 5) with means ranging from 3.4 to 5.3. Activity 4, "assessing patient's understanding on every new medication they receive" has the highest mean at 5.30 and activity 5, which deals with counseling on first refill, has a mean score of 4.19. This indicates that pharmacists typically report that they counsel 60 to 80% of their patients on new medications and 40 to 60% of their patients on refills. Comparing the ranks of the individual items between the two studies shows some interesting similarities and differences. For both studies, activities 4 and 1 are the ranked 1 and 2 respectively. Activity 5 ranked 3rd for the present study with a mean of 4.2 (s.d. = 1.6). This item was split out from Van der Veen's original measure concerning assessing patient understanding of medications.

Table 4-6: Drug Therapy Management Index

Activity	Question and Response Coding	Van Der Veen Mean[a] (s.d) (n = 34)	Van Der Veen Rank for 13 items	Study Mean (s.d) (n = 82)	Study Rank for 15 items
1. Taking responsibility for identifying my patient's drug related problems.	**Question:** For approximately what percent of your patient do you actually do this task? **Response Categories and Coding:** 0 to 5 % = 1 5 to 20 % = 2 20 – 40 % = 3 40 – 60% = 4 60 – 80% = 5 80 – 100% = 6	4.5 (1.4)	2	4.5 (1.5)	2
2 Getting essential clinical data from my patient (e.g., illnesses, therapy, complaints or symptoms)		3.7 (1.5)	4	3.5 (1.6)	4
3. Entering and/or interpreting clinical information		3.7 (1.7)	3	3.4 (1.7)	5
4. Assessing my patient's understanding on every new medication they receive		5.8 (0.6)	1	5.3 (1.1)	1
5. Assessing my patient's experience with their medications with every first refill		n/a[b]	n/a[b]	4.2 (1.6)	3
6. Intervening to adjust my patient's medication regimen		2.9 (1.4)	9	2.8 (1.5)	8
7. Documenting counseling, interventions and observations		3.2 (1.5)	5	2.9 (1.8)	7
8. Composing a list of drug-related problems		2.9 (1.4)	10	2.2 (1.4)	12

Table 4-6: Drug Therapy Management Index (Continued)

Activity	Question and Response Coding	Van der Veen Mean[a] (s.d) (n = 34)	Van der Veen (Rank for 11 items)	Study Mean (s.d) (n = 82)	Study (Rank for 15 items)
9. Deciding (with my patient) which alternative therapy is best	**Question:** For approximately what percent of your patient do you actually do this task? **Response Categories and Coding:** 0 to 5 % = 1; 5 to 20 % = 2; 20 – 40 % = 3; 40 – 60% = 4; 60 – 80% = 5; 80 – 100% = 6	3.1 (1.4)	7	2.6 (1.5)	11
10. Designing a therapeutic drug-monitoring plan that looks at adverse effects		3.1 (1.4)	8	2.2 (1.4)	13
11. Evaluating whether desired outcomes are being achieved		3.2 (1.3)	6	3.1 (1.6)	6
12. Follow-up on therapy and outcomes on a long-term basis		2.5 (1.0)	11	2.6 (1.5)	10
13. Encouraging the use of compliance aids to my patients with complex problems (medication regimens)		n/a[b]	n/a[b]	2.7 (1.7)	9
14. Performing disease state management for certain groups of patients with the same disease or problem		2.3 (0.8)	13	1.8 (1.0)	14
15. Performing special services (e.g., blood pressure checks, glucose monitoring, etc.)		2.4 (0.9)	12	1.7 (1.0)	15
Scale Mean for this Study: 45.9 (s.d. = 14.1) Possible index range = 0 to 90 Actual index range = 17.0 to 80.0 Alpha for index = 0.89					

[a] Van der Veen's scoring used a 2 to 6 scale; scoring for present study was 1 to 6

[b] n/a = not available. These two questions were not included in Van der Veen's study.

The two items with the largest difference in rank from the Van der Veen study to the present study are activity 9 (Van der Veen rank = 7; present study rank = 11) and activity 10 (Van der Veen rank = 8; present study = 13). There are two possible explanations for the differences in rank for these two items. First is that two new items were added to the list of activities. Second, the study populations were different between the two studies. Van der Veen's (1999) study population was newly licensed pharmacists while the study population involved in this study ranged in the length of time they have been practicing.

Previously, the items had been grouped to represent three different practice models, enhanced patient counseling, generalized pharmaceutical care, and disease state management (Van der Veen, 1999). Therefore, to validate the use of the items in a single index, correlations between the DTMI and the number of drug therapy management services provided within a pharmacy, billing for cognitive services and Pharmacy Service Orientation were examined. The number of DTMI services provided was collected from the telephone interview with the pharmacy manager. Seven DTMI services were identified from all services provided and included: diabetes services, asthma services, hypertension services, hyperlipidemia services, anticoagulation services, immunizations, and smoking cessation. The number of services provided ranged from 0 to 7, with 24 pharmacies offering no additional DTMI services. Table 4-7 presents the number of DTMI services for the sample. The correlation between DTMI and additional drug therapy management services was not significant ($r = -0.04$, $p = 0.80$). Billing for cognitive services has a positive and significant correlation with DTMI ($r = 0.31$, $p = 0.05$). Billing for cognitive services is one of the tasks necessary for the payment of cognitive services and the positive correlation supports the

Table 4-7: Drug Therapy Management Services Provided by Pharmacies in Sample

Number of Drug Therapy Management Services	Total Sample (n = 39)
0	24
1	7
2	3
3	3
4	1
5	0
6	0
7	1
Mean number of services provided = 0.8 Range = 0 – 7	

validity of the DTMI measure. Lastly, the correlation between pharmacy service and DTMI was examined. A Pharmacy Service Orientation (PSO) score is obtained by taking the mean of three items examining the orientation (patient versus product), the focus (quality versus quantity) and the pharmacist work (professional versus technical). Each item was scored from 1 to 9, with 1 being more product-focused and 9 being more patient-focused. The PSO ranged from 2 to 9 with a mean of 7.1. In examining the correlations, there is a positive correlation between DTMI and PSO ($r = 0.43$, $p = 0.006$). This suggests that the pharmacy service orientation of the pharmacy corresponds to the level of drug therapy management services provided by the pharmacy.

Future Time Perspective

The independent variable for this study is Future Time Perspective (FTP). The purpose of the FTP is to determine the dominant time period for organizations. Future Time Perspective was measured using a two-part question originally developed by Cottle (1976; 1968) and adapted by Das (1986). Cottle (1976; 1968) examined the time orientations, both past and present, of naval personnel enrolled in a physician assistant program. Das (1986) focused on the future time orientations of bankers working for a large multi-state bank organization. In the original format, Cottle (1976: 25) asked respondents to identify 10 important experiences. The original was phrased: "Please list the ten most important experiences of your life. These may be experiences you have had, you are having and experiences you expect to have." Respondents then were asked to select a time period from the five provided (distant past, near past, present, near future, and distant future) that related to each experience. In contrast, Das (1986) asked respondents to supply only nine experiences and used four future time periods (very near future, near future, distant future,

and very distant future). Cottle's original question asked respondents to focus on 10 experiences. In his writings, Cottle (1976; 1968) comments that the decision to ask for 10 responses was arbitrary and was based on the fact that it allowed the potential for two experiences per time period. Das (1986) based his decision to ask for nine experiences on feedback from executives who pretested his instrument. Based on pretesting comments received from university and practitioner colleagues the decision was made to ask respondents for only six experiences to decrease respondent burden.

The phrasing of the question for this study was: "On the lines below, list six important experiences you expect to happen in your own personal life in the future. These experiences may be pharmacy or non-pharmacy related" (emphasis in original). After listing the experiences, respondents were asked to select a time period that best represented when they thought the event would occur. The time periods provided were: present, very near future, near future, distant future and very distant future. The "present" time period was added to those provided by Das (1986) as many pharmacists state that they do not have enough time to provide additional services, suggesting that they may focus more on the present.

Response categories and coding for the Future Time Perspective measure were: "present" = 1, "very near future" = 2, "near future" = 3, "distant future" = 4, and "very distant future" = 5. The Future Time Perspective Score is calculated by summing the experience scores and dividing by the number of experiences. This allowed the retention of respondents who did not list six experiences. The mean for Future Time Perspective is 3.32 (s.d. = 0.65) out of a possible score range of 1 – 5, indicating that, on average, pharmacists have a future time perspective focused in the near future.

Control Variables

The rationale for addition of control variables to the model is to provide alternative explanations for the relationships of interest between future time perspective and strategic, operational and drug therapy management activities. Aneshensel (2002) identifies three major types of association, chance, spuriousness and redundancy, that may affect the relationship between independent and dependent variables. Schwab (1999) on the other hand, specifies six types of "nuisance" variables, i.e., variables that if not controlled may impact the causal relationships between the independent and dependent variable. They are: bias, spuriousness, suppressor, mediators, moderators, and noise (Schwab, 1999). The six nuisance variables identified by Schwab (1999) may be classified into the three major types of association identified by Aneshensel (2002).

There are several methods that may be used to identify control variables, including previous research and theory. When appropriate control variables cannot be identified through previous research, theoretical considerations may be used to identify appropriate control variables. In organizational research, one method used to control for alternative explanations is to conduct research within a single industry such as banking (Das, 1986), small technology (El Sawy, 1983), hospitals (Ruef & Scott, 1998). This study focused on a single industry, (i.e., community pharmacy practice) to help methodologically control for alternative explanations related to other types of pharmacy practice such as in-patient hospital, long-term care, etc. Three variables will be used as statistical controls.

Ownership. Within community pharmacy, however, independently-owned, health-system owned, and corporately-owned chain pharmacies were considered[10]. As described in Chapter 3, the sample was stratified based on ownership category to ensure that pharmacies of all three ownership types were represented in the final sample (Churchill, 1995). Importantly, pharmacies vary systematically across these ownership categories with regard to their organizational structure; this has the potential to impact the relationship between the independent and dependent variables. Here, ownership is considered a control variable.

Prescription Workload. In previous pharmacy research, workload has been identified as variable related a pharmacist's ability to provide drug therapy management services (e.g., Cranor & Christensen, 2003a; Odedina, Segal, & Hepler, 1995). Prescription workload is defined here as the average number of prescriptions dispensed per week divided by the total number of pharmacist hours per week:

$$\text{Prescription Workload} = \frac{\text{Prescriptions per week}}{\text{\# Pharmacist hours per week}}$$

This provides an estimate of the average number of prescriptions a pharmacist fills per hour.

Table 4-8 presents the means and standard deviations for prescription workload by ownership category. The average prescription workload for a pharmacy in this study is 12.3 (s.d = 4.5) prescriptions per pharmacist hour. Independently-owned pharmacies have the lowest prescription workload on average at 10.2 (s.d. = 3.3) prescriptions per pharmacist hour. Health-system owned pharmacies have an average workload of 12.8 (s.d. = 3.2).

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[10] Ownership categories are further subdivided by the profession, national associations and others including: independently-owned, franchisee, small chain, traditional chain, supermarket, discount retailer, managed care, health-system, etc. Due to the relatively small sample in the study, all pharmacies were grouped into three broad ownership categories.

Table 4-8: Prescription Workload[a] by Ownership Category – Descriptive Statistics

Ownership	N	Min	Max	Mean [b]	St. Dev.
Independent	10	5.4	16.5	10.2	3.3
Health-System	17	5.9	18.0	12.8	3.2
Corporate Chain	12	4.3	25.0	13.5	6.3
Total Sample	39	4.3	25.0	12.3	4.5

[a] Workload = Weekly prescription volume/number of pharmacist hours per week.
[b] Workload: one-way ANOVA, no significant difference across groups ($F = 1.7$, $p = 0.2$)

Corporately-owned chain pharmacies present with the highest average workload at 13.5 (s.d. = 6.3). While having the highest prescription workload reported at any single site at 25.0 prescriptions per pharmacist hour, a corporate chain pharmacy also reported the lowest prescription workload (4.3 prescriptions per pharmacist hour). The range on the workload variable is similar for independently-owned and health-system owned pharmacies at 11.1 and 12.1 respectively. There was no significant difference across ownership categories on prescription workload when tested using a one-way ANOVA.

Pharmacist Intensity. Pharmacist intensity defined as the number of pharmacist hours per week divided by the total staff hours (pharmacist and technician) per week. This provides a complimentary measure to workload. Pharmacist intensity provides an indication of the percentage of total staffing hours that are allocated to pharmacists. A higher pharmacist intensity score may reflect a pharmacy's increased reliance on pharmacists for service provision. In contrast, a lower pharmacist intensity score reflects a pharmacy's increased reliance on technicians to help with service provision. Table 4-9 presents the means and standard deviations for pharmacist intensity by ownership category. Average pharmacist intensity is 46.1% with a range of 26.4% to 100%. Corporately-owned chain and health-system owned pharmacies have the relatively similar average scores (42.1 and 44.3 respectively) while independently-owned pharmacies have a pharmacist intensity score of 54.2%. The differences across the ownership categories is not statistically significant (one-way ANOVA $F = 2.7$, $p = 0.08$) though it is approaching significance.

Pharmacist intensity needs to be kept in context. Higher pharmacist intensity scores mean that pharmacists work a greater percentage of total staff hours. Some would argue that

Table 4-9: Pharmacist Intensity[a] by Ownership Category – Descriptive Statistics

Ownership	N	Min	Max	Mean[b]	St. Dev.
Independent	10	34.2	100.0	54.2	19.3
Health-System	17	32.4	63.6	44.3	8.5
Corporate Chain	12	26.4	60.6	42.1	11.1
Total Sample	39	26.4	100.0	46.1	13.3

[a] Pharmacist intensity = Weekly pharmacist hours/Weekly total staff hours (pharmacist and technician).
[b] Pharmacist intensity: one-way ANOVA, no significant difference across groups ($F = 2.7$, $p = 0.08$)

a higher percentage means the pharmacy is staffed in such a way as to facilitate drug therapy management activities. Others would argue that a lower pharmacist intensity score, to a point, suggests that the pharmacy is utilizing support personnel to a greater extent, therefore, "freeing up" pharmacists to perform more advanced patient care services. No specific number has been identified in the literature as the appropriate ratio necessary in the provision of drug therapy management activities (Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002). The total number of pharmacist and technician hours will vary from pharmacy to pharmacy not only based on prescription volume but on the types and scope of drug therapy management services that are provided. While defining a "perfect" ratio of pharmacist to total staff hours is not possible, pharmacist intensity nonetheless reflects differences in how pharmacies engage staff for the purpose of meeting consumer/patient needs.

AGGREGATION AND DATA ANALYSIS ISSUES

The constructs of interest, i.e., future time perspective, strategic management, operational management and drug therapy management are conceptualized and analyzed at the organizational level. In this section, I will discuss general aspects and issues related to aggregation of individual level data to construct organizational measures and handling missing data and non-response bias. Chapter 5 will present the aggregated results.

Aggregation Issues

Data for this study were collected from key informant interviews and individual responses to survey questions with the goal of describing pharmacies. Thus, aggregating individual-level data is necessary. One of the challenges in data aggregation is deciding what method to use to aggregate the data. Data collected at the individual level may be aggregated

in various ways, including use of the mean of the individual respondents within an organization or using the standard deviation of the variable of interest (Hox, 2002). In using the mean of the variable of interest, one can weight the respondents equally, by adding the scores and dividing by the number of respondents (Hox, 2002). Another method is to weight the means measures by social position, with means first calculated by social position and the means of the social positions are then pooled to calculate an organizational mean (see, e.g., Aiken & Hage, 1966; Flood & Scott, 1987). In her study examining community pharmacies, Johansen (1999) identified four social positions within the community pharmacies that she studied: pharmacist supervisor, pharmacist staff, technician supervisor, and technician staff. This reflected her decision to have "social positions carry equal weight in the construction of the global variables" (Johansen, 1999: 42) and is the same process used by Aiken and Hage (1966) in their study of 16 welfare agencies.

This project applies the reasoning and process used by Johansen. Respondents are the pharmacists at participating pharmacies; technicians and other non-professional staff were not included. Therefore, means were computed based on position (pharmacy manager versus staff pharmacists) and then the organizational mean for each measure was calculated.

Other issues in data aggregation are related to the trade-offs involved in the process. There are potential costs involved in data aggregation. Dess, Newport and Rasheed (1993) identify "information loss" as a consideration to take into account when raw data (i.e., respondent data) are used to create a new variable. Information loss is related to the potential decrease in variability on the measures after data is aggregated. Yet, one of the benefits of data aggregation is that "it enhances the appropriateness of generalizing beyond one firm" (Dess, Newport, & Rasheed, 1993). That is, comparisons may be made across firms or

organizations. Because the aims of this study are to examine similarities and differences between organizations, the benefits of aggregation outweigh the potential costs.

Missing Data

Prior to conducting data analysis, it is necessary to address the issue of missing data. Missing data occurs for a variety of reasons related to processes of data collection and entry and to actions of the respondent through incomplete responses to the questions (Hutcheson & Sofroniou, 1999; Schwab, 1999). Missing data can "affect the inferences drawn about variables, and the generalizability of the result to a population" (Hutcheson & Sofroniou, 1999:18). Therefore, an examination of missing data should be completed in the following areas: randomly versus selectively missing data, the extent of the missing data, and the pattern of the missing data (Cohen & Huang, 2000). There are several approaches available to deal with missing data. Listwise deletion is "often used as a quick coping strategy" (Cohen & Huang, 2000:292) for dealing with missing data. The problem with listwise deletion, especially in a small sample, is that biased estimates may be generated (Little & Rubin, 1987). Another method used to deal with missing data is mean substitution (Garson, 2003) (Little & Rubin, 1987). Missing data may be replaced with the series mean, the mean or median of nearby points, linear interpolation, or substitution of linear trend value for that point (Garson, 2003). Series mean replacement is a commonly used and conservative approach, though it does have its disadvantages (Schwab, 1999). First, the variance of a variable is reduced because the mean is probably closer to itself than to the missing value it replaces (Lehtonen & Pahkinen, 1995; Tabachnick & Fidell, 1996). Second, the actual distribution of values is distorted. And third, some argue that the increase in power associated with this method is spurious (Schwab, 1999). In general there is no

unambiguously correct or incorrect way to address missing data (Schwab, 1999:337). This study will use the series mean replacement approach in dealing with missing data.

Self-Report Data Issues

Issues regarding measurement errors with self-report data have been identified by various methodologists (e.g., Cook & Campbell, 1979; Runkel & McGrath, 1972; Shadish, Cook, & Campbell, 2002). The issues include "over and under distortions related to social desirability, evaluation apprehension, and sensitization to experimental design" (Feldman & Lynch, 1988: 421). In particular, one would anticipate inflated self-report of drug therapy management activities by pharmacists. In examining the individual items in the DTMI, however, none of the items has a severe negative skew. In fact, many of the items have a positive skew, which corresponds to fewer patients receiving these activities.

Key Informant Data Issues

Key informants have been used in organizational research as proxies for the organization. One of the reasons to use key informants for data collection is that they have substantial knowledge of the core issues involving the organization (Gupta, Shaw, & Delery, 2000; Kumar, Stern, & Anderson, 1992; Seidler, 1974). In addition, informants are more likely to generalize "about patterns of behavior, after summarizing either observed (actual) or expected (prescribed) organizational relations" (Seidler, 1974:817).

As with other research techniques, the use of key informants has several drawbacks. Informants report may be tainted by "both *informant bias* and *random error*" (Kumar, Stern, & Anderson, 1992). Key informant bias results from differences related to respondents varying roles in the organization (Kumar, Stern, & Anderson, 1992; Seidler, 1974). That is, views of respondents from different levels of an organization may vary systematically. Also,

key informant reports suffer from recall issues related to hindsight bias, attributional bias, and impression management (Huber & Power, 1985; Salancik & Meindl, 1984). For this study, both key informant reports and follow-up questionnaires were used to minimize the weaknesses of relying solely on key informant data.

Nonresponse Bias Issues

Nonresponse "is a failure to obtain information from some elements of the population that were selected and designated for the sample" (Churchill, 1995). Nonresponse is a critical issue facing researchers using telephone or self-administered, mail surveys (Churchill, 1995; Dillman, 2000). There will always be some level of nonresponse bias in data collection involving respondents. As a result, researchers strive to reduce nonresponse the level of nonresponse bias in a variety of ways including follow-up mailings, reminder cards, and incentives (Churchill, 1995; Dillman, 2000).

Since this study involved both a telephone interview and a follow-up survey, various methods were used to decrease nonresponse bias. For the telephone interview, a letter of introduction and a letter of support from the UW School of Pharmacy Dean were sent to the pharmacy managers and at least three telephone contacts were made to schedule the interview with the pharmacy manager. With the follow-up survey, methods used to increase response rate included: a letter of introduction appealing to the respondents, reminder letters, survey replacement, and pre-stamped return envelopes for the surveys (Dillman, 2000)

To assess if non-response bias is an issue, comparisons were made between early responders (i.e., 25% of responders who returned surveys in ≤ 7 days) and late responders (i.e., returned after 22 days). There were no substantive or statistically significant differences (Mann-Whitney U and Kolmogorov-Smirnov tests not significant) across the demographic

categories presented, suggesting that there was little difference between early and late responders. Table 4-10 presents the comparison of early and late responders for key demographics variables and the variables of interest in the study. None of the t-tests for differences of means were significant between early and late responders.

PLAN FOR DATA ANALYSIS

The measures presented in this chapter are converted to variables for use in the analyses that follow in Chapters 5 and 6 (See Table 4-11 for summary information). Chapter 5 presents the descriptive results related to the variables. Univariate results will be examined for the full sample and by ownership for each of the study and control variables. Demographic data will be analyzed to provide a description of the pharmacist participating in the study. Chapter 6 presents the bivariate and multivariate analyses related to the aggregated data for the statistical prediction of drug therapy management. Bivariate analysis will be used to examine the correlations between the study and control variables. Ordinary least squares regression will be used to examine the relationships between the study variables. The *a priori* definition for significance was set at $p \leq 0.05$ (1-tailed) and used for the directional hypotheses, with significance set at $p \leq 0.05$ (2-tailed) and used for the control variables.

SUMMARY

In this chapter, I discussed the construction of the indexes and measures used for this study. I further described the development of each measure and the method of coding. Then I addressed issues related to data aggregation and missing data. In the following chapters, I will present descriptive and analytic study results.

Table 4-10: Test for Significant Difference Between Early and Late Responders

Variable	Early and Late Responders [a]	N	Mean	Std. Deviation	t-test t, d.f.	Sig. (2-tailed)
Age (years)	Early	23	41.7	10.2	0.71, 42	0.48
	Late	21	39.5	9.9		
Years in Practice	Early	23	17.2	10.5	1.34, 42	0.19
	Late	21	12.9	10.5		
Tenure at site (years)	Early	23	9.4	8.9	0.44, 42	0.66
	Late	21	8.2	8.9		
Future Time Perspective	Early	23	3.2	0.4	-1.70, 42	0.10
	Late	21	3.4	0.7		
Strategic Management Index	Early	23	54.2	26.6	1.57, 42	0.12
	Late	21	42.0	24.6		
Operational Management Index	Early	23	152.9	46.8	1.81, 42	0.08
	Late	21	128.3	42.8		
Drug Therapy Management Index	Early	23	49.3	13.0	1.79, 42	0.08
	Late	21	42.5	12.2		

[a] The 25th percentile for Days to Respond $\leq$ 7.0 days and 75th percentile for Days to Respond $\geq$ 22 days.
Days to Respond descriptive statistics: Mean = 16.3, s.d. = 12.5, min = 2, max = 52

Table 4-11: General Operationalization of the Study Variables

Variable Name	Data Source
FTP = Future Time Perspective	Survey - Q29
SMI = Strategic Management Index	
Aggregate of:	
Vision	Survey – Q4 and Q4a
Mission	Survey – Q5 and Q5b
Plan	Survey – Q6 and Q6a
OMI = Operational Management Index	
Aggregate of:	
Organizing Index	
Coverage of Schedule	Survey - Q8
Posting of Schedule	Survey – Q9
Frequency of Updating Drug Information Database	Survey – Q27
Implementing Index	
Pharmacist Training	Survey – Q12 and Q13
Technician Training	Survey – Q15 and Q16
Reimburse for Professional Development	Survey – Q19
Control Index	
Performance Review	Survey – Q18 and Q18a
Quality Assessment/Quality Improvement Program	Survey – Q28
Financial Control	Survey Q 24 b, c, d, e and f
DTMI = Drug Therapy Management Index	Survey – Q1a, b, c, g, i, k, l, m, n, o, p, q, r, s, t
Control Variables	
OWNER = Ownership	Interview – Q1a
WORKLOAD = Prescription Workload	Interview – Q4 and Q6
RPHINT = Pharmacist Intensity	Interview – Q6 and Q8

CHAPTER 5: DESCRIPTIVE RESULTS

In Chapter 3, I discussed the research methods followed by a discussion of the measures in Chapter 4. In this chapter I will present descriptive results including response rates, characteristics of the responding sample, and comparisons by ownership and position on the variables of interest. This provides a foundation for Chapter 6 which will address the bivariate and multivariate results.

RESPONSE RATES

Stage 1: Telephone Interview

In Stage 1, 73 pharmacy managers were contacted to reach a sample size of 50 participating pharmacies. This represented a Stage 1 participation rate of 69.9%. To ascertain a pharmacy's participation status, three attempts were made to contact the pharmacy manager before replacing the pharmacy with the next pharmacy in the contact order list. The majority of pharmacy managers who declined to participate did so upon telephone contact. The dominant rationales for non-participation were they "were too busy" and "didn't have enough time." Table 5-1 summarizes the participation rates by data collection wave and ownership category. Wave 1 had the highest participation rate (91.6%) and Wave 3 had the lowest (55.2%). The lower response rate in Wave 3 is likely attributable to several factors. First, Wave 3 pharmacies are located in the Madison area and are in close proximity to the School of Pharmacy. Proximity may result in these pharmacies being more heavily engaged by the School of Pharmacy for teaching and research purposes, thereby

Table 5-1: Telephone Interview Participation Rates by Data Collection Wave and Ownership

Data Collection Wave	Independents	Health-System	Corporate Chain	Total
Wave 1				
Pharmacy Mangers Contacted [a]	2	6	4	12
Pharmacy Managers Participating	1	6	4	11
Participation Rate (%)	50.0	100.0	100.0	91.6
Wave 2				
Pharmacy Mangers Contacted [a]	17	4	11	32
Pharmacy Managers Participating	10	4	9	23
Participation Rate (%)	58.8	100.0	81.8	71.2
Wave 3				
Pharmacy Mangers Contacted [a]	11	7	11	29
Pharmacy Managers Participating	5	6	5	16
Participation Rate (%)	45.5	85.7	45.5	55.2
Total				
All Pharmacy Mangers Contacted [a]	30	17	26	73
Pharmacy Managers Participating	16	16	18	50
Participation Rate (%)	53.3	94.1	69.2	68.4

[a] Number of pharmacy managers sent "Pharmacy Recruitment Packet"

placing an increased burden on these pharmacies. Secondly, a major chain in this region refused to have its pharmacies participate in the study; this accounted for five refusals.

In looking at participation rate by ownership for the telephone interviews, pharmacy managers working health-system owned pharmacies had the highest overall participation rate at 94.1%. Pharmacy managers working for corporately-owned chain pharmacies had the second highest participation rate at 69.2%, with pharmacy managers working for independently-owned pharmacies having the lowest overall participation at 53.3%.

Stage 2: Follow-up Survey

As part of the telephone interview, pharmacy managers were asked to provide the names of the professional pharmacist staff members (pharmacists, residents and interns) working in their pharmacies. One hundred and forty-nine professional pharmacist staff members were identified across the 50 pharmacies. One hundred and ninety-nine follow-up surveys were sent to the pharmacy managers (n = 50) and professional pharmacists staff members (n = 149). Pharmacy interns and residents comprised approximately 18% (n = 26) of the professional pharmacist staff surveyed; they were excluded from all further discussion based on their high rates of non- or incomplete response to the follow-up survey. Table 5-2 presents the response rates for the follow-up survey for the 172 surveys sent to the licensed pharmacists (i.e., pharmacy mangers and staff pharmacists) at participating pharmacies.

The overall response rate was 68.6% (118/172), with a response rate ranging from 0% (n = 2 pharmacies) to 100% (n = 20 pharmacies). The response rate was highest for pharmacy managers and staff pharmacists in Wave 2 (100% and 73.6%, respectively), with an overall response rate of 81.5%. The overall response rates for the other two data collection waves were slightly below 60%. In Wave 1, one pharmacy manager did not

Table 5-2: Follow-Up Survey Response Rates by Data Collection Wave for Pharmacy Managers and Pharmacist Staff

Data Collection Wave	Pharmacy Managers	Staff Pharmacist	Total
Wave 1			
Sent	11	22	33
Received	10	9	19
Response Rate (%)	90.9	40.9	57.6
Wave 2			
Sent	23	57	80
Received	23	42	66
Response Rate (%)	100.0	73.6	82.5
Wave 3			
Sent	16	43	60
Received	13	20	33
Response Rate (%)	81.3	45.5	55.0
Total			
Sent	50	122	172
Received	46	71	118
Response Rate (%)	92.0	57.3	68.6

complete the follow-up survey, while in Wave 3, three pharmacy managers did not complete the follow-up survey. In two of the pharmacies with no pharmacy manager response, no pharmacist staff members completed the follow-up, resulting in a zero percent response rate for these two pharmacies; one pharmacy was a corporately-owned chain and the other was a health-system owned pharmacy. In general, response rate for UW-Madison School of Pharmacy researchers has been 50% or greater in research involving pharmacists and/or consumers. The response rate for this study is consistent with recent UW-Madison School of Pharmacy study response rates (Cline & Mott, 2003; Ganther & Kreling, 2000; Schommer & Wiederholt, 1994).

After cleaning and examining the data for missing values, decisions to exclude individuals and whole pharmacy organizations were made. Eleven pharmacies were excluded from the data analysis due to missing data. Reasons for exclusion included: 1) two pharmacies had no responses to the follow-up survey; 2) four pharmacy managers did not complete the follow-up survey; 3) three pharmacy managers had missing data on the independent variable (i.e., future time perspective); 4) one pharmacy was an atypical community practice, predominately providing specialized compounding services; and 5) one pharmacy had a response rate of only 16.6%. Additionally, six individual respondents were excluded from data analysis due to completely missing data on key variables. This resulted in including 39 of 50 (78%) participating pharmacies and 82 of 118 (69%) individual survey respondents (39 pharmacy managers and 43 staff pharmacists) in the data analysis.

DESCRIPTION OF RESPONDING SAMPLE

Individual Respondents by Position

Table 5-3 presents demographic characteristics (i.e., gender, age, years in practice, tenure and education of individual respondents). The majority of pharmacists responding were male (62.2%) with 74.4% of pharmacy managers and 51.2% of staff pharmacists being male. The NACDS (2003c) *Chain Pharmacy Employment Survey* found 67% of chain pharmacists are male, while *The Pharmacist Workforce* study (Health Resources and Services Administration, 2000) found males make up 54% of the overall pharmacist workforce.

The mean age of pharmacists' was 41.5 years which is slightly lower than the mean age of 44.0 (s.d. 12.7) found by Mott and colleagues (2001:695) in their study of the pharmacy workforce in four states. Pharmacy managers have a higher mean age (44.1 years; s.d. = 8.6) than the pharmacist staff (39.2 years; s.d. = 10.5). Based on a Mann-Whitney U test for differences between two groups, there is a significant difference in age between pharmacy managers and staff pharmacists ($Z = -1.96$, $p = 0.05$). No pharmacy managers were under 26 years old; the largest percentage of pharmacy managers were between the ages of 46 – 55 years old (41.0%). The two largest age groups for pharmacist staff were 26 - 35 and 36 – 45 years of age (30.2% each). Eighty percent of females were less than 46 years of age compared with 49% of males. This is similar to the findings of Mott and colleagues (2001).

The plurality of pharmacists (35.3%) have been in practice less than 10 years, with those practicing for 20-29 years representing the second largest group (29.3%).

Table 5-3: Individual Respondent Demographics

Demographic	Pharmacy Manager (n = 39)		Staff Pharmacist (n = 43)		Total (n = 82)	
	n	%	n	%	n	%
Gender[a]						
Male	29	74.4	22	51.2	51	62.2
Female	10	25.6	21	48.8	31	37.8
Age (years)[a]	**Mean = 44.1 s.d = 8.6**		**Mean = 39.2 s.d. = 10.5**		**Mean = 41.6 s.d = 9.9**	
25 or less	0	0.0	4	9.3	4	4.9
26 – 35	9	23.1	13	30.2	22	26.8
36 – 45	11	28.2	13	30.2	24	29.3
46 – 55	16	41.0	9	21.0	25	30.5
56 – 65	3	7.7	4	9.3	7	8.5
Years in Practice[a]	**Mean = 18.7 s.d. = 9.7**		**Mean = 14.5 s.d = 10.6**		**Mean = 16.5 s.d = 10.3**	
0 – 9	12	30.8	17	39.5	29	35.3
10 – 19	7	17.9	12	27.9	19	23.2
20 – 29	14	35.9	10	23.3	24	29.3
30 - 39	6	15.4	4	9.3	10	12.2
Tenure (years)[b]	**Mean = 9.9 s.d = 8.8**		**Mean = 7.6 s.d = 8.6**		**Mean = 8.7 s.d = 8.7**	
0 – 9	21	53.8	31	73.8	52	64.2
10 – 19	12	30.8	5	11.9	17	21.0
20 – 29	4	10.3	5	11.9	9	11.1
30 - 39	2	5.1	1	2.4	3	3.7
Education/Training						
Pharmacy Education						
BS Pharmacy[a]	39	100.0	35	81.4	71	86.6
PharmD[a]	0	0.0	8	18.6	8	9.8
BS Pharm/PharmD	0	0.0	3	7.0	3	3.6
Additional Degrees						
BS/BA Degree	4	10.3	5	11.6	9	11.0
MS Degree[a]	5	12.8	0	0.0	5	6.1
PhD Degree	1	2.6	0	0.0	1	1.2
Fellowship/Residencies						
Residency	0	0.0	0	0.0	0	0.0
Fellowship	1	2.6	0	0.0	1	1.2
Certification Programs						
1 certification	9	23.1	7	16.3	16	19.5
2 certifications	11	28.2	4	9.3	15	18.3

[a] Mann-Whitney U tests were significant when testing for differences for age, gender, years in practice, BS pharmacy, Pharm D, and MS Degree. The Kolmogorov-Smirnov tests were not significant when testing for differences on any of these variables between pharmacy managers and pharmacist staff members.

[b] Tenure is defined as years at the current pharmacy.

Approximately 36 percent of pharmacy managers have been practicing between 20 – 29years in contrast to the approximately 40% of staff pharmacists who have been in practice for less than 10 years. In contrast to years in practice, tenure at current pharmacy is less than 10 years for 64% (n = 52) of the pharmacists, with almost 74% (31/43) of staff pharmacists at their pharmacies for less than 10 years. Only three pharmacists, 2 pharmacy managers and 1 staff pharmacist have been at their pharmacies for 30 years or more. With the current pharmacist shortage (HRSA 2000; Pharmacy Manpower Project 2000), this is not a complete surprise. Pharmacists are in a profession that allows great mobility across pharmacy settings and states.

The vast majority of pharmacists have a BS Pharmacy degree (86.6%). The first graduating class of the all PharmD program at the UW SOP was in 2001, helping to explain the predominance of BS degree pharmacists. Six respondents, all of whom are pharmacy managers, have additional education beyond the BS Pharmacy degree; five have master's degrees, predominately MBAs, and one has a PhD. Thirty pharmacists have furthered their education through acquisition of certification and examination. One pharmacist has a Board of Pharmaceutical Specialties (BPS) certification, which means they have passed an examination and must pass a recertification exam every five years (Board of Pharmaceutical Specialties, 2003). The other 29 pharmacists have certifications in a range of areas including diabetes, asthma, immunization, and ostomy services. Fourteen of these pharmacists (10 pharmacy managers, 4 staff pharmacists) have multiple certifications.

Differences between pharmacy managers and staff pharmacists were tested for each of the demographic variables. Results from the Mann-Whitney U test for differences between pharmacy managers and staff pharmacist were significant for gender, age, years in

practice, BS Pharmacy degree, PharmD degree and MS degree. (See Table 5-3 for complete list of demographic variables). Results from the Kolmogorov-Smirnov Z-test did not result in any significant differences between pharmacy managers and staff pharmacists on any of the demographic measures. In addition, comparisons were made between early and late responders on age, years in practice and years at current site and there were no significant differences.

Demographics by Ownership

With significant differences between pharmacy managers and staff in the total sample on age and years in practice, the next step was to examine differences between pharmacists working in the three ownership categories of pharmacies, independent, health-system and corporate chain. Table 5-4 presents age, years in practice and tenure by ownership and position (pharmacy manager, staff pharmacist). Average age of pharmacists in all three ownership categories is similar at approximately 42 years old. Pharmacists' average number of years in practice is also similar across the three ownership categories at approximately 17 years. In contrast, there is a significant difference across ownership based on tenure in current pharmacy (one-way ANOVA $F = 3.13$, $p = 0.05$), with pharmacists in independently-owned pharmacies having tenure almost double that of pharmacists in health-system owned and corporately-owned chain pharmacies (12.0, 6.7 and 6.3 years, respectively).

Pharmacy Characteristics

Stage 1 telephone interviews with pharmacy managers collected data regarding hours of operation, prescription volume, pharmacist hours, technician hours, pharmacist intensity, number of certified technicians, and additional services provided. Table 5-5 presents these pharmacy characteristics for each ownership category and the total sample.

Table 5-4: Tests for Differences on Age, Years in Practice and Tenure across Ownership Categories

		Age (years)		Years in Practice		Tenure (years)	
Ownership	**n**	**Mean**	**s.d.**	**Mean**	**s.d.**	**Mean**	**s.d.**
Independents	25	41.9	8.4	17.6	8.8	12.0	6.9
Health-system	35	42.0	9.0	15.7	9.9	6.7	5.2
Corporate Chain	22	43.4	7.2	18.2	8.2	6.3	5.2
Total	82	42.4	8.2	16.9	8.9	7.9	6.0
ANOVA F, d.f. Sig.		0.79, 2 0.46		1.36, 2 0.26		3.13, 2 0.05	

Table 5-5: Pharmacy Characteristics by Ownership (n = 39)

			Ownership			ANOVA
Characteristic	**Statistics [d]**	**Total Sample (n = 39)**	**Independent Ownership (n = 10)**	**Health-System Ownership (n = 17)**	**Corporate Chain Ownership (n = 12)**	**F, d.f. Sig.**
Hours of Operation (weekly)	Mean Std. dev. Range	59.7 12.9 40 – 82	55.8 5.9 45 – 64	52.4 11.2 40 – 77	73.2 8.4 60 – 82	18.98; 2, 36 0.00*
Prescription Volume (weekly)	Mean Std. dev. Range	1240.4 748.1 300 – 3725	1159.9 522.3 360 – 2100	1217.2 775.5 493 – 3725	1340.4 904.4 300 – 3150	0.16; 2, 36 0.85
Pharmacist Hours (weekly)	Mean Std. dev. Range	103.8 55.1 40 – 276	117.5 55.6 65 – 250	101.2 63.7 40 – 276	96.2 42.5 40 – 186	0.43; 2, 36 0.65
Technician Hours (weekly)	Mean Std. dev. Range	136.6 83.7 0 – 355	122.0 80.37 0 – 248	123.9 65.6 40 – 240	155.2 113.6 50 – 355	0.56; 2, 36 .57
Prescription Workload [a] (prescriptions per pharmacist hour)	Mean Std. dev. Range	12.3 4.5 4.29 – 25.00	10.2 3.3 5.41 – 16.47	12.8 3.2 5.86 – 18.00	13.5 6.3 4.29 – 25.00	1.68; 2, 36 0.20
Pharmacist Intensity [b]	Mean St. dev. Range	46.2 13.3 26.49 – 100	54.2 19.3 34.21 – 100	44.3 8.5 32.43 - 63.63	42.1 11.1 26.49 – 60.91	2.73, 2, 36 0.08

Table 5-5: Pharmacy Characteristics by Ownership (n = 39) Continued

			Ownership			ANOVA
Characteristic	**Statistics**	**Total Sample (n = 39)**	**Independent Ownership (n = 10)**	**Health-System Ownership (n = 17)**	**Corporate Chain Ownership (n = 12)**	**F, d.f. Sig.**
Percent of Technicians Certified [c]	Mean Std. dev. Range	19.1 25.3 0 – 100	11.0 19.1 0 – 50	23.3 32.3 0 – 100	19.9 17.4 0 – 50	0.74; 2, 36 0.48
Number of Additional Services Provided	Mean Std. dev. Range	2.0 2.3 0 – 9	4.4 2.9 0 – 9	1.3 1.4 0 – 4	0.9 1.0 0 – 3	12.13; 2,36 0.00*

[a] Prescription Workload calculation: weekly prescription volume/weekly pharmacist hours = prescriptions per pharmacist hour
[b] Pharmacist Intensity: Total pharmacist hours per week/ (total pharmacist hours + total technician hours) per week
[c] Percent Technicians Certified: number technicians certified/number of technicians x 100
* One-way ANOVA, significant at p = 0.00

Hours of Operation

The mean number of hours of operation of all pharmacies in the study is approximately 60 hours per week, with a range from 40 to 82 hours per week. Health-system owned pharmacies have the lowest average hours of operation at 52 hours per week. This may be attributed to the fact that many health-system pharmacies are located in clinics that have limited hours of operation. Corporately-owned chain pharmacies have the highest average hours of operation at 73 hours per week. A one-way ANOVA comparing the differences in mean hours of operation by ownership shows that there is a significant difference in the hours of operation by ownership ($F = 18.98$; $df = 2, 36$; $p = 0.00$).

Prescription Volume

There is relatively wide variability in weekly prescription volume across the three ownership types. Health-system owned pharmacies have the largest range regarding weekly prescription volume, with the difference between the lowest and the highest being 3232 prescriptions per week. Corporate chain owned pharmacies have the next largest range between lowest and highest at 2150. Independently-owned pharmacies have the smallest range in prescription volume at 1740. When one examines the mean deviation (standard deviation divided by the mean) of each ownership category, corporate chain pharmacies have the highest variation, followed by health system, and independents (mean deviation = 0.67, 0.63, and 0.45, respectively). A one-way ANOVA was not significant in comparing differences across the ownership categories.

Pharmacist and Technician Hours

In examining pharmacist and technician hours, independently-owned pharmacies use the most pharmacist hours per week (117.5 hours) and the fewest technician hours per week

(122 hours). This contrasts with corporately-owned chain pharmacies which use the fewest pharmacist hours (96.2 hours) and the most technician hours (155.2 hours). Not only do corporate chains use the lowest average pharmacist hours, they have the fewest pharmacists working at any given hour of operation, with approximately 1.3 pharmacists working per hour in comparison to independents and health-system pharmacies that average greater than 2.0 pharmacists per hour of operation. In making the same comparison for technicians, pharmacies in all three ownership categories average approximately 2.0 technicians per hour of operation. One-way ANOVA finds no statistical difference across the ownership categories based on pharmacist and technician hours.

Prescription Workload

Prescription workload is defined as prescription volume per week divided by the number of pharmacist hours per week. Corporately-owned chain pharmacies average a workload of almost 13.5 prescriptions per pharmacist hour. In contrast, the average workload in health-system owned pharmacies is 12.8 prescriptions per pharmacist hour and independently owned pharmacies have the lowest workload average at 10.2 prescriptions per pharmacist hour. In examining the mean deviation for workload across the three ownership categories, the lowest variation is in health-system pharmacies (mean deviation = 0.25). In contrast, the mean deviation for independents and corporate chains are 0.33 and 0.47 respectively. Again, using one-way ANOVA to test for differences across the ownership categories resulted in the finding of no significant difference.

Pharmacist Intensity

Pharmacist intensity is the percentage of pharmacist time scheduled compared to total staff hours (i.e., pharmacist and technician hours) per week. It presents a picture slightly

different from workload in that it indicates the staffing mix in the pharmacy. The higher the pharmacist intensity, the higher pharmacist hours are in relation to total pharmacy staffing hours. For example, if pharmacist intensity is 45%, then technician hours account for 55% of the total pharmacy staff hours. For the total sample, pharmacist intensity is approximately 46%, with independently-owned pharmacies having the highest pharmacist intensity at 54%. In contrast, corporately-owned chain pharmacies have the lowest pharmacist intensity at 42%, with health-system owned pharmacies a similar score at 44%. When comparing differences across the three ownership categories using a one-way ANOVA, the difference is not statistically significant ($F = 2.73$; $df = 2, 36$; $p = 0.08$), though it is approaching significance.

Certified Technicians

Overall, the low percentage of certified pharmacy technicians as a proportion of all technicians in a pharmacy is not surprising given that the national certification examination has been in place only since 1995. This national examination is offered through the Pharmacy Technician Certification Board (PTCB) with the goal of "help(ing) pharmacists in their efforts to implement pharmaceutical care" (Pharmacy Technician Certification Board, 2003). Technician certification is voluntary in the state of Wisconsin. Health-system owned pharmacies have the highest mean percentage of certified pharmacy technicians (23.3%), with independently-owned pharmacies having the lowest average percentage of certified pharmacy technicians (11.0%). One possible explanation for the high percentage of certified pharmacy technicians in health-system owned pharmacies is that this is a result of benefits given on the institutional (hospital) section of the organization. When testing for differences across ownership categories the one-way ANOVA was not significant.

Number of Additional Services

The number and type of additional services that community pharmacies provide beyond traditional dispensing varies. The range of additional services provided included: diabetes monitoring, asthma monitoring and education, immunizations, home IV therapy, servicing of group homes and nursing homes, smoking cessation program, weight management, vasectomy follow-up services and anti-coagulation monitoring. The number of additional services provided by these pharmacies varies from zero to nine. Independently-owned pharmacies provide, on average, 4.4 additional services. Health-system owned and corporately-owned chain pharmacies provide, on average, 1.29 and 0.92 additional services, respectively. When testing the difference in means with the use of a one-way ANOVA, the difference between ownership categories is significant at $F = 12.13$ ($p = 0.00$). This suggests that independently-owned pharmacies are providing more patient care services than health-system or corporately-owned chain pharmacies. One possible explanation for the lower-number of additional services provided in health-system pharmacies is that some additional services may be provided by other health professionals within the clinic, thus attributing to the lower number for the pharmacies.

RESEARCH AIM 1

Research Aim 1 is to describe community pharmacies in regard to future time perspective (FTP), strategic management index (SMI), operational management index (OMI), and drug therapy management index (DTMI). I will present the univariate results for each of the variables for the total sample and by ownership category.

Future Time Perspective (FTP)

Table 5-6 presents descriptive statistics for the full sample and by ownership for future time perspective. Recall that future time perspective was measured by asking respondents to list six experiences in their own personal life that they expected to happen in the future and to place each of those experiences in one of five time periods. The time periods were coded: "present" = 1, "very near future" = 2, "near future" = 3, "distant future" = 4, and "very distant future" = 5. Future time perspective was calculated by summing the experiences and dividing by the number of experiences with a score range of 0 to 5. Chapter 4 details the coding for this measure.

The full sample's overall mean for FTP was 3.3 (s.d = 0.5). Corporately-owned chain pharmacies had a slightly higher mean FTP score (mean = 3.5, s.d. = 0.5), with independently-owned and health-system owned pharmacies having the same mean FTP score, 3.3 (s.d. = 0.4, 0.5 respectively). All of the mean scores correspond to the time period between near future and distant future. The Kolmogorov-Smirnov Test for normality of distribution was not significant for the full sample or any of the ownership categories. In testing for differences across ownership categories on the FTP mean scores, the one-way ANOVA was not significant ($F = 0.835$; $p = 0.44$).

A direct comparison to Das' work (1986) is not possible at the individual level as Das used only four time periods (very near future, near future, distant future and very distant future) whereas I had included five time periods, with the addition of the "present." In

Table 5-6: Future Time Perspective for the Total Sample and by Ownership

	N	Min	Max	Mean [a]	St. Dev.
Independent	10	2.67	4.25	3.26	0.44
Health-System	17	2.60	4.00	3.26	0.48
Corporate Chain	12	2.83	4.59	3.47	0.49
Total Sample	39	2.60	4.59	3.33	0.47

[a] One-way ANOVA not significant across ownership, $F = 0.835$, $p = 0.442$

addition, the final level of analysis for this study is at the organizational level, therefore a direct comparison with Das is not possible.

Strategic Management Index (SMI)

As discussed in Chapter 4, SMI incorporates three, two-part questions, focused on the vision, mission and plans of the pharmacy and pharmacists' awareness in these three areas. The higher the SMI score, the more likely that the pharmacy has a vision, mission and plan in place and that the pharmacists within the site are familiar with these items. This indicates that the future is thought about to a greater or lesser extent in the pharmacy. Table 5-7 presents the SMI results for the full sample by ownership. The SMI scores ranged from 0 to 90 for the full sample, with a mean SMI score 0f 48.0. Kolmogorov-Smirnov Test for normality of distribution was not significant for the full sample or any of the ownership categories for SMI. One-way ANOVA identifies a statistically significant difference across ownership categories for SMI ($F = 4.55$, $p = 0.02$). Corporate chains have the highest mean SMI score at 60.7 (s.d. = 21.6) and independent pharmacies have the lowest mean at 35.9 (s.d. = 26.9) which is only 59% of the corporate chain mean SMI score.

Operational Management Index (OMI)

OMI is a composite of three functional indexes, organizing, implementing and controlling; each functional index has a maximum score of 90 and the OMI has a maximum score of 270. The OMI and the functional indexes were discussed in Chapter 4. Recall that they focus on activities necessary to meet the objectives of the organization and that these activities have conceptions of time embedded in them. That is, the higher the OMI score, the more future oriented the pharmacy is in regard to operational activities. Table 5-8 presents the OMI results for the full sample and by ownership.

Table 5-7: Strategic Management Index for the Total Sample and by Ownership

	N	Min	Max	Mean [a]	St. Dev.
Independent	10	0.00	66.4	35.9	26.9
Health-System	17	28.5	67.5	46.2	11.2
Corporate Chain	12	31.5	90.0	60.7	21.6
Total Sample	39	0.0	90.0	48.0	21.2
[a] One-way ANOVA significant across ownership; $F = 4.55$, $p = 0.017$					

Table 5-8: Operational Management Index for the Total Sample and by Ownership

	N	Min	Max	Mean [a]	St. Dev.
Independent	10	63.6	175.3	132.1	38.4
Health-System	17	71.5	180.0	130.9	29.1
Corporate Chain	12	104.5	194.0	156.9	31.6
Total Sample	39	63.6	194.0	139.2	33.8

[a] One-way ANOVA non-significant between ownership; $F = 2.625$, $p = 0.087$

The mean OMI score for the full sample is 130.2 (s.d. = 33.8). Again, corporately-owned chain pharmacies have the highest average OMI score (mean = 156.9, s.d. = 31.6) and the highest minimum (104.5) and maximum (194.0) scores of the three ownership categories. Independents and health-system pharmacies have similar mean OMI scores (133.2 and 130.9, respectively). Thus, it appears that corporate chain pharmacies as a group tend to focus further into the future regarding operational management activities. The Kolmogorov-Smirnov Test for normality of distribution was not significant for the full sample or any of the ownership categories for OMI. When examining the differences in means for the OMI scores across the ownership categories, the one-way ANOVA is approaching significance ($F = 2.615$; $p = 0.09$).

Drug Therapy Management Index (DTMI)

The drug therapy management index (DTMI) is a summary index of 15 activities with each activity scored on a scale of one to six, as described in Chapter 4; the maximum score is 90. All of the activities included in the DTMI go beyond the minimum level of care required by many state pharmacy practice acts. Again, there is a time element embedded within this index. This means that for each activity some awareness of the future is necessary; some of those futures may be more immediate than others. For example, the activity of "assessing my patient's understanding on every new medication they receive" is an immediate activity that a pharmacist performs related to the dispensing of a new medication. In contrast, the activity of "designing a therapeutic drug-monitoring plan that looks at adverse effects" requires a pharmacist to anticipate possible future events to develop the plan. Therefore, a higher score on the DTMI indicates that pharmacists within a given pharmacy are providing more drug therapy management activities to their patients.

Table 5-9 presents descriptive results for the sample and by ownership for DTMI. The mean DTMI score for the full sample is 45.8 (s.d. = 12.3). Independently-owned and corporately-owned chain pharmacies have similar DTMI scores (mean = 49.2, s.d = 12.1; mean = 49.4, s.d. = 10.0, respectively) while health-system owned pharmacies are lower (mean = 42.9, s.d. = 13.9). The Kolmogorov-Smirnov Test for normality of distribution was significant only for corporately-owned chain pharmacies ($p = 0.01$). After examining the frequency distribution of scores, the skew can be attributed to one corporate chain pharmacy outlier with a DTMI score of 76.2. The next closet DTMI score within the corporate chains is 53.0. When the outlier pharmacy is removed and the Kolmogorov-Smirnov Test is rerun, the normality of distribution becomes non-significant for the corporately-owned chain pharmacies ($p = 0.20$). When examining the differences across ownership categories for DTMI, the one-way ANOVA was not significant ($F = 0.982$; $p = 0.38$). Stated simply, there is not a significant difference between the ownership categories on DTMI.

SUMMARY

In this chapter I presented descriptive information about the pharmacists and pharmacies participating in the study and then presented univariate statistics regarding the study variables. The majority of pharmacists in the study were male (62.2%). Pharmacists in the study averaged 41.5 years of age and had been in practice, on average for almost 19 years. The average tenure, years at current worksite, was almost 10 years for all pharmacists. The vast majority (87%) of pharmacists had a BS Pharmacy degree. Approximately 37% of pharmacists had acquired certification in the treatment of a specific disease or specialty area of practice.

Table 5-9: Drug Therapy Management for the Total Sample and by Ownership

	N	Min	Max	Mean [a]	St. Dev.
Independent	10	25.2	67.5	49.2	12.1
Health-System	17	17.0	75.0	42.9	13.9
Corporate Chain	12	35.0	76.2	49.4	10.0
Total Sample	39	17.0	76.2	45.8	12.3
[a] One-way ANOVA non-significant between ownership; F = 0.982, p = 0.384					

Pharmacy characteristics included hours of operation, prescription volume, pharmacist and technician hours, prescription workload, pharmacist intensity, percent of certified pharmacy technicians and the number of additional services provided. The average pharmacy is open 60 hours per week and has a weekly prescription volume of approximately 1250 prescriptions. Staffing for the average pharmacy has pharmacists covering approximately 100 hours per week and technicians working approximately 140 hours per week, with average pharmacist intensity at 46. The average prescription workload for a pharmacy is 12 prescriptions per pharmacist hour of work. Certified technicians make up almost 20% of all technicians. Lastly, the average pharmacy provides approximately two additional services to their patients. Pharmacies vary on these characteristics, though the only characteristic that is significantly different across the ownership categories is hours of operation.

The future time perspective of pharmacies ranged from very near future to very distant future with the average time period being near future. In other words, pharmacies have future time perspectives and they vary across pharmacies and ownership categories. Pharmacies also vary on how future oriented they are regarding strategic management activities. Corporate-chain pharmacies have the highest mean SMI score at 60.7 while independent pharmacies have the lowest mean SMI score at 35.9 with a significant difference across ownership categories on SMI. Corporate chain pharmacies are more future oriented then health-system and independent pharmacies regarding SMI. In contrast, there is no significant difference across ownership on the OMI, though corporate chain pharmacies tend to focus further into the future then independent or health-system pharmacies. The mean

DTMI score is 45.8 (out of 90), with no significant difference across the ownership categories.

CHAPTER 6: ANALYTIC RESULTS

Chapter 5 provided a description of the sample and univariate analysis of the control, independent, and dependent variables. This last point addressed Research Aim 1. This chapter will address Research Aims 2 and 3 and their related hypotheses through the use of bivariate and multivariate analysis. Research Aim 2 focuses on the relationship between future time perspective and strategic, operational and drug therapy management. Research Aim 3 is to examine the relationships between strategic, operational and drug therapy management.

BIVARIATE RESULTS

Table 6-1 shows the Pearson correlations (1-tailed) between the study variables based on the aggregated data. The rationale for examining the correlations is to see what relationships exist among the study variables.

Control Variables

Ownership, prescription workload, and pharmacist intensity are the three control variables included in the model; the rationale for their use was discussed in Chapter 4. Three ownership category variables were created to allow for comparisons based on ownership. Each ownership category was dummy coded (0 = no, 1 = yes) then included in the bivariate analysis. When a variable has three categories, in this case, independent, health-system and corporate chain, it is suggested that subsequent analysis occur by omitting one of the categories (Field, 2000). Prescription workload and pharmacist intensity were calculated from key informant data as continuous variables, as described in Chapter 4. Bivariate plots

Table 6-1: Pearson Correlations and Descriptive Statistics for Study Variables (n = 39)

	Independent	Health-System	Corporate Chain	Pharmacist Workload	Pharmacist Intensity	FTP	SMI	OMI	DTMI
Independent Ownership (0 = no)	1								
Health System Ownership (0 = no)	- 0.516**	1							
Corporate Chain Ownership (0 = no)	- 0.391*	- 0.586**	1						
Prescription Workload	- 0.284	0.087	0.175	1					
Pharmacist Intensity	0.356*	- 0.123	- 0.205	- 0.538**	1				
Future Time Perspective (FTP)	- 0.086	- 0.120	0.210	0.173	- 0.071	1			
Strategic Management Index (SMI)	- 0.339*	- 0.077	0.404*	- 0.035	- 0.285	- 0.044	1		
Operational Management Index (OMI)	- 0.126	- 0.220	0.356*	- 0.065	- 0.055	0.149	0.558**	1	
Drug Therapy Management Index (DTMI)	0.021	- 0.205	0.200	- 0.109	- 0.142	0.178	0.336*	0.492**	1
Mean	0.3	0.4	0.3	12.3	46.2	3.3	48.0	139.2	45.8
Std. Dev.	0.4	0.5	0.5	4.5	13.3	0.5	21.2	33.8	12.3

***Correlation is significant at the 0.05 level (2-tailed) for control variables and (1-tailed) for study variables.**
****Correlation is significant at the 0.01 level (2-tailed) for control variables and (1-tailed) for study variables.**

of the correlations are presented in Appendix G. There are several significant correlations between the control variables themselves and with the study variables. First, looking at ownership categories, there are significant correlations between the three ownership categories pairings; predictably, all relationships have a negative correlation and all are significant at $p < 0.05$.

Second, there is a significant relationship between independent ownership and pharmacist intensity. Independent ownership has a positive correlation with pharmacist intensity ($r = 0.356$, 2-tailed, $p < 0.05$). This suggests that pharmacists working in independently-owned pharmacies, work a greater proportion of the total staff hours (pharmacist and technician).

Finally, there is a significant negative correlation between prescription workload and pharmacist intensity ($r = -0.538$, 2-tailed, $p < 0.01$), suggesting that across all ownership types, the higher the pharmacist intensity the lower the prescription workload for a pharmacist.

Independent and Dependent Variables

Future Time Perspective (FTP)

Recall that FTP was measured taking the mean of the time periods identified by respondents and then aggregating the individual scores to the level of the pharmacy. In examining the correlations between future time perspective, control variables and the dependent variables, none of the correlations is significant. This is contrary to what I hypothesized in H1, H2, and H3 of Research Aim 2 which predicted that longer future time perspective would be associated with greater future orientation in strategic, operational and drug therapy management.

Strategic Management Index (SMI)

Of the eight pairings involving SMI that were tested, four correlations were significant. Strategic management was significantly correlated with both independent ownership and corporate chain ownership; given how ownership variables were constructed, these correlations are, as expected, in the opposite directions (independents: $r = -0.339$, 2-tailed, $p < 0.05$; corporate chain $r = 0.404$, 2-tailed, $p < 0.05$). This suggests that pharmacists in corporate chain pharmacies have more of the strategic management elements in place and that there is a high awareness of the goals of the organization, thus indicating a longer time perspective. Conversely, the negative correlation between SMI and independent ownership suggests that pharmacists in independent settings have fewer of these elements in place and lower awareness of the goals of the organization, suggesting a shorter time perspective.

SMI is significantly correlated with the operational management index (OMI) ($r = 0.558$, 1-tailed, $p < 0.01$) and the drug therapy management index (DTMI) ($r = 0.336$, 1-tailed, $p < 0.05$). This is consistent with the conceptualization of strategic management and operational management as described by Daft (1991) and Griffin (1990). It is also consistent with the emphasis placed on practice management as described in the pharmacy literature (i.e., Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002). This suggests that the length of the time frame taken with strategic management activities positively predicts the length of time taken regarding both operational management and drug therapy management activities.

Operational Management Index (OMI)

The operational management index is the sum score of three functional index scores related to organizing, implementing and controlling with an index score range of 0 to 270. OMI is positively correlated with corporate chain ownership ($r = 0.356$, 2-tailed, $p < 0.05$).

In examining the other two ownership categories, though not significant, both independent and health-system ownership are negatively correlated with OMI. This is the same pattern seen for SMI and the three ownership categories. Again, this suggests that corporate chain pharmacies have a longer time perspective regarding OMI activities than do independently-owned or health-system owned pharmacies.

OMI is also positively and significantly correlated with drug therapy management ($r = 0.492$, 1-tailed, $p < 0.01$). This suggests that the length of the time frame taken regarding operational management activities is predictive of the time frame taken regarding drug therapy management activities. The positive and significant relationships between SMI and OMI, SMI and DTMI, and OMI and DTMI support H4, H5 and H6 of Research Aim 3.

REGRESSION MODELS

Bivariate analysis was conducted to further address the hypotheses related to Research Aims 2 and 3. After examining the distributions of the variables, ordinary least squares regression was identified as an appropriate method for testing the hypotheses.

In building the regression model with three ownership categories, it was necessary to make a decision concerning which ownership category would serve as the omitted category in the regression models. Health-system ownership was identified as the appropriate ownership category to be omitted from the regression analysis based on examination of the correlations and the greater differences between the means on the study variables for the other two ownership categories. The series of regression models were based on the operationalization of the research model (see Figure 2-4). Prescription workload, pharmacist intensity and ownership (independent and corporate chain) may have an impact on the

management activities within pharmacies and therefore are being controlled for in this analysis. These variables were entered into the model as a group. In the research model, SMI and OMI are intervening variables. As a result, OLS regressions were run to identify the potential predictors of SMI, OMI and DTMI. Residual analyses for all models tested are included in Appendix H.

Predicting Strategic Management

Table 6-2 presents the regressions predicting strategic management. First the control variables were regressed on SMI. Corporate chain ownership has a significant positive relationship to SMI ($\beta = 0.32$, $p = 0.05$). Prescription workload and pharmacist intensity were negatively related to SMI (both $\beta = -0.32$, $p = 0.07$ and $p = 0.08$, respectively). The control variables, as a group, are significant predictors of SMI ($F = 3.58$, $p = 0.015$).

Next, future time perspective is added to the regression model. Future time perspective is hypothesized to have a positive relationship with strategic management (H1). Results in Table 6-2 show that Hypothesis 1 is not supported. Model 2 shows that FTP is not a significant predictor of SMI ($\beta = -0.10$, $p = 0.25$). Further, the model's variance explained is essentially unchanged from Model 1 (Model 1 $R^2 = 0.296$; Model 2 $R^2 = 0.306$). Regression coefficients for control variables change little from Model 1 to Model 2, reinforcing bivariate results show in Table 6-1 that FTP is independent of these variables.

Predicting Operational Management

Next, predictors of operational management were examined (see Table 6-3). Again, the control variables were first regressed on OMI; this is seen in Model 1. Corporate chain ownership has a significant relationship with OMI ($\beta = 0.37$, $p = 0.02$), though the Model 1 itself is not significant.

Table 6-2: Regression Analyses Predicting Strategic Management Index (SMI)

Variable	Model 1		Model 2	
	β	Sig.*	β	Sig.*
Prescription Workload	-0.32	0.07	-0.30	0.10
Pharmacist Intensity	-0.32	0.08	-0.32	0.08
Independent Ownership	-0.19	0.26	-0.19	0.27
Corporate Chain Ownership	0.32	0.05	0.34	0.04
FTP			-0.10	0.25
Multiple R	0.544		0.553	
R^2	0.296		0.306	
Adjusted R^2	0.213		0.201	
F	3.58		2.91	
df	4, 34		1, 33	
Sig.*	0.015		0.014	

ns = non-significant

*Control variables reported using 2-tailed significance; predictor variables and overall model reported using 1-tailed significance

Table 6-3: Regression Analyses Predicting Operational Management Index (OMI)

Variable	Model 1		Model 2		Model 3		Model 4	
	β	Sig.*	β	Sig.*	β	Sig.*	β	Sig.*
Prescription Workload	-0.17	0.38	-0.19	0.35	-0.02	0.93	0.01	0.97
Pharmacist Intensity	-0.07	0.73	-0.07	0.71	0.11	0.56	0.11	0.55
Independent Ownership	-0.004	0.98	-0.007	0.97	0.10	0.55	0.10	0.55
Corporate Chain Ownership	0.37	0.04	0.35	0.06	0.16	0.35	0.20	0.23
FTP			0.10	0.27	0.16	0.14		
SMI					0.56	0.001	0.54	0.002
Multiple R	0.383		0.395		0.614		0.595	
R^2	0.147		0.156		0.377		0.354	
Adjusted R^2	0.046		0.028		0.260		0.256	
F	1.46		1.22		3.22		3.61	
df	4, 34		5, 33		6, 32		5, 33	
Sig.*	0.24		0.16		0.007		0.005	

-- = excluded from fitted regression model

*Control variables reported using 2-tailed significance; predictor variables and overall model reported using 1-tailed significance

Future time perspective was added next as seen in Model 2. It was hypothesized that FTP has a positive relationship with OMI (H2). Results in Table 6-3 show that Hypothesis 2 was not supported. Model 2 shows that FTP is not a significant predictor of OMI ($\beta = 0.10$, $p = 0.27$). Further, the model's variance explained changes slightly from Model 1 ($R^2 = 0.046$) to Model 2 ($R^2 = 0.028$). Regression coefficients for control variables change little from Model 1 to Model 2, reinforcing bivariate results shown in Table 6-1 that FTP is again independent of these variables.

Next, SMI was added to the regression (Model 3). Results in Table 6-3 show that Hypothesis 4 is supported. Model 3 shows that SMI is a significant predictor of OMI ($\beta = 0.56$, $p = 0.001$). Further, the model's variance explained increases significantly from Model 2 (Model 2 $R^2 = 0.028$; Model 3 $R^2 = 0.260$). Regression coefficients for control variables also change from Model 2 to Model 3, reinforcing bivariate results shown in Table 6-1 that there is a relationship between SMI and OMI.

A fitted model for predicting OMI was assessed. In examining the fitted model, SMI is the only significant predictor of OMI ($R^2 = 0.256$; $F = 3.61$, d.f = 5, 33, $p = 0.005$). This is consistent with the results of Model 3 in predicting OMI. Thus the length of time considered for strategic management activities is a significant predictor of the length of time considered for operational management activities.

Predicting Drug Therapy Management Index

The last series of regressions examine predictors of drug therapy management (see Table 6-4). Again, the control variables were first regressed on DTMI and the results are shown in Model 1. No research hypotheses were tested in this model, though prescription workload and pharmacist intensity each had a negative relationship with drug therapy

Table 6-4: Regression Analyses Predicting Drug Therapy Management Index (DTMI)

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	Sig.*	β	Sig.*	β	Sig.*	β	Sig.*	β	Sig.*
Prescription Workload	-0.27	0.18	-0.30	0.14	-0.20	0.31	-0.20	0.30	-0.19	0.29
Pharmacist Intensity	-0.29	0.16	-0.30	0.14	-0.20	0.33	-0.24	0.22	-0.26	0.16
Independent Ownership	0.14	0.44	0.14	0.46	0.20	0.29	0.16	0.38	0.15	0.39
Corporate Chain Ownership	0.24	0.17	0.21	0.25	0.11	0.57	0.04	0.82	0.08	0.66
FTP			0.18	0.30	0.21	0.11	0.14	0.19		--
SMI					0.31	0.06	0.08	0.36		--
OMI							0.41	0.02	0.49	0.001
Multiple R	0.348		0.388		0.464		0.564		0.547	
R^2	0.121		0.150		0.215		0.318		0.300	
Adjusted R^2	0.018		0.022		0.068		0.165		0.194	
F	1.17		1.17		1.46		2.07		2.82	
df	4, 34		5, 33		6, 32		7, 31		5, 33	
Sig.*	0.34		0.17		0.11		0.04		0.016	

-- = excluded from fitted regression model

*Control variables reported using 2-tailed significance; predictor variables and overall model reported using 1-tailed significance

management. This suggests as both of these increase, there is a decrease in drug therapy management activities. None of the control variables were significant predictors of drug therapy management. The overall F statistic for the model was not significant ($F = 1.17$, $p = 0.34$).

Next, FTP was added to the regression model (H3). Results presented in Model 2 (Table 6-4) show that Hypothesis 3 was not supported. Model 2 shows that FTP is not a significant predictor of DTMI ($\beta = 0.18$, $p = 0.30$). Further, the model's variance explained is essentially unchanged from Model 1 (Model 1 $R^2 = 0.018$; Model 2 $R^2 = 0.022$). Regression coefficients for control variables change little from Model 1 to Model 2, reinforcing bivariate results shown in Table 6-1 that FTP is independent of the variables.

Next, the strategic management index (SMI) was added to the model (Model 3). Strategic management (SMI) is predicted to have a positive effect on drug therapy management and therefore is tested as a directional hypothesis (H4). Model 3 shows that SMI is approaching significance in predicting DTMI ($\beta = 0.31$, $p = 0.06$). Though the model's variance slightly increases from Model 2 (Model 2 $R^2 = 0.022$; Model 3 $R^2 = 0.068$). Results show in Table 6-4 (Model 3) show that Hypothesis 5 is not supported.

Lastly, the operational management index (OMI) was added to the model (Model 4) and is predicted to have a positive effect on DTMI (H6). Model 4 shows that OMI is a significant and positive predictor of DTMI ($\beta = 0.41$, $p = 0.02$). Further, the model's variance explained changes from Model 3 ($R^2 = 0.068$; $p = 0.11$) to Model 4 ($R^2 = 0.165$; $p = 0.04$). The regression coefficient for SMI changes significantly from Model 3 ($\beta = 0.31$, $p = 0.06$) to Model 4 ($\beta = 0.08$, $p = 0.36$) with the addition of OMI to the regression model. This suggests that the effects of SMI on drug therapy management are mediated through OMI, as

predicted in the research model. The fitted model predicting DTMI (Model 5) shows that only OMI significantly predicts drug therapy management ($R^2 = 0.30$, $F = 2.82$, d.f. = 5, 33, $p = 0.016$). This is consistent with the results presented in Model 4 and supports Hypothesis 6.

SUMMARY OF HYPOTHESIS TESTING

Bivariate and regression analyses were completed to test the six hypotheses outlined in Chapter 2. Following is a summary of the hypotheses and a summary of whether results of data analyses provided support for each.

Research Aim 2: Examine potential relationships between future time perspective and strategic, operational and drug therapy management

H1: The higher the future time perspective of the pharmacy, the more future oriented the pharmacy is in strategic management.

H2: The higher the future time perspective of the pharmacy, the more future oriented the pharmacy is in operational management.

H3: The higher the future time perspective of the pharmacy, the more future oriented the pharmacy is in drug therapy management

In the bivariate correlations and multivariate regression analyses, future time perspective was not significantly related to strategic, operational or drug therapy management. Based on these results, these three hypotheses are rejected.

Research Aim 3: Examine potential relationships between strategic and operational management and drug therapy management.

H4: The more future oriented the pharmacy is in strategic management, the more future oriented the pharmacy is in operational management.

H5: The more future oriented the pharmacy is in strategic management, the more future oriented the pharmacy is in drug therapy management.

H6: The more future oriented the pharmacy is in operational management, the more future oriented the pharmacy is in drug therapy management.

The bivariate correlation analysis identified significant relationships between strategic management, operational management, and drug therapy management, supporting these three hypotheses. Results of the regression analyses show that SMI is a significant predictor of OMI, supporting H4. When testing the relationship between SMI and DTMI, results show that the effect of SMI on DTMI is mediated by OMI. Therefore, H5 is supported only indirectly. Operational management has a significant positive relationship with drug therapy management, supporting H6.

Overall, when examining the predictors of SMI, OMI and DTMI, one sees that SMI is a significant predictor of OMI and OMI is a significant predictor of DTMI. This supports the notion that strategic management influences operational management which in turn influences drug therapy management. In other words, longer time orientation regarding strategic management predicts longer the time orientation regarding operational management which predicts longer time orientation in drug therapy management. These relations are seen when controlling for selected pharmacy characteristics. Corporate chain ownership is a significant predictor of SMI, while prescription workload and pharmacist intensity are approaching significance. Thus, pharmacy characteristics seem to play an important role in predicting the length of time that pharmacies consider when engaged in management activities.

CHAPTER 7: DISCUSSION AND CONCLUSIONS

Drug therapy management with its focus on continuous, longitudinal patient care, entails a new way of thinking about time in pharmacy practice. Specifically, it is change in provision of care from episodic, transaction-based patient encounters, to patient-focused and relationship-based patient encounters. Some of those advocating this new model of pharmacy practice also have recognized that changes in strategic and operational management are necessary for the provision of drug therapy management services. Drawing on this, the present study explores the relationship between future time perspective, strategic management, operational management, and drug therapy management in community pharmacies. I chose this topic and organizational focus to examine time as a cultural element of the organization and its relationship to these various management activities. Specifically, I was interested in the culture of time in community pharmacies and its relationship to management activities.

This chapter will provide a summary of the findings of this study, including identifying those hypotheses that were supported and those that were not. It is important to examine both types of findings for, as Albert Einstein (year unknown) said " I have not failed, I've just found 10,000 ways that don't work." Next, limitations will be discussed, followed by research implications and future research.

SUMMARY OF FINDINGS

Development and implementation of drug therapy management services represents a significant change in how the pharmacy profession views its role in the provision of patient

care. Much research in pharmacy has examined individualistic factors related to the adoption or non-adoption of drug therapy management. Only a few studies have examined how the characteristics of organization itself might impact the adoption of drug therapy management. This led to the research aims for this study:

> **Research Aim 1:** Describe community pharmacies in regard to their future time perspective and their strategic, operational and drug therapy management activities.
>
> **Research Aim 2:** Examine potential relationships between future time perspective and strategic, operational and drug therapy management.
>
> **Research Aim 3:** Examine potential relationships between strategic and operational management and drug therapy management.

Figure 2-4 (Chapter 2) presents a visual representation of the proposed relationships among the concepts incorporated into these research aims.

Descriptive Results

In Chapter 5, three control variables and four study variables were examined. The three control variables were ownership, pharmacist workload, and pharmacist intensity were originally included in the model. The four study variables were future time perspective, strategic management index, operational management index and drug therapy management index. Descriptive results were presented for the full sample of pharmacies and by ownership.

Control Variables

Three ownership categories were examined, independent ownership, health-system ownership and corporate chain ownership. Ownership categories were included as control variables because the organizational structure of pharmacies may vary systematically and this has the potential to impact relationships among the study variables. There was not a

significant difference across pharmacy ownership categories on the majority of pharmacy characteristics examined. The only pharmacy characteristic with a significant difference across the ownership categories was hours of operation.

Prescription workload and pharmacist intensity were both examined. Prescription workload measured the mean number of prescriptions a pharmacist in a particular pharmacy fills in a typical hour of work. Prescription workload for the full sample was 12.3 prescriptions per hour. Average prescription workloads differed by ownership category with corporate chains having the highest workload (13.5) and pharmacists in health-system-owned and independently-owned pharmacies having average workloads less than this. In comparison, a rule established by the North Carolina Board of Pharmacy set a safety threshold of approximately 19 prescriptions per pharmacist hour (White, Xiao, Simon, & Campbell, 2002). Prescription workload, on average, for the participating pharmacies fell below this safety threshold. Differences across the ownership categories are not significant when tested using a one-way ANOVA.

Pharmacist intensity is defined as the proportion of pharmacist hours compared to total staff (pharmacist and technician) per week. For the total sample, pharmacist intensity is approximately 0.46, with independently-owned pharmacies having the highest pharmacist intensity at 0.54. In contrast, corporately-owned and health-system owned pharmacies have lower, yet similar intensity scores (0.42 and 0.44 respectively). When comparing differences across the ownership categories the differences are not statistically significant (one-way ANOVA $F = 2.73$, $p = 0.08$).

Future Time Perspective

Community pharmacies' future time perspectives vary considerably across organizations from the very near future to the very distant future. Overall, pharmacies in this study have a future time perspective (FTP) that falls between the near future and the distant future time periods (mean = 3.33 out of 5.00). Independently-owned and health-system owned pharmacies have a slightly lower FTP score than corporately-owned chain pharmacies (means = 3.26, 3.26 and 3.47 respectively). No pharmacy has an FTP score that places them in the present time period. One-way ANOVA found no significant difference across the ownership categories for future time perspective.

Strategic Management Index

The strategic management index (SMI) measured a pharmacy's implementation and its pharmacists' awareness of the organization's vision, mission, and plan. Community pharmacies have an overall range from 0 to 90 and mean score of 48.0 (out of 90). SMI scores vary by ownership category, with corporate chain pharmacies reporting a significantly higher SMI score (mean = 60.7) than independently-owned (mean = 35.9) or health-system owned pharmacies (46.2). In examining the range of scores by ownership, independently-owned pharmacies have the lowest SMI scores overall, with three independently-owned pharmacies scoring zero on the SMI (7.7%). This compares to Harrison and Ortmeier's (1996:587) finding that 69% of community pharmacies did no strategic planning based on the seven steps defined in their study. Two of those steps were related to development of the pharmacy's mission statement, goals and objectives and to formulation of a plan. Similar findings have been found in the strategic management literature within small businesses; that is, small businesses are less likely than medium to larger organizations, to report that they

engaged in strategic management activities (Robinson Jr. & Pearce II, 1984; Sandberg, Robinson, & Pearce II, 2001; Shuman & Seeger, 1986; Woods & Joyce, 2003)

Operational Management Index

The operational management index (OMI) is a measure of operational activities and the frequency and/or period of time within which these activities occur. An example would be the period of time that is covered by the work schedule for pharmacy staff and when the schedule is posted. With a possible OMI score range of zero to 270, the mean OMI score for all pharmacies is 139. When examining differences by ownership category, there were no significant differences between the OMI scores.

The range of OMI scores for all pharmacies is 64 to 194 (out of 270). There are possible explanations for scores "topping out" at approximately 200; the three are not mutually exclusive. One is that some activities within this index are being carried out at a higher level and for more patients. Or it could be that all activities are being done, but only at the minimum level necessary for the organization to continue functioning. Another possible explanation is that pharmacists want to focus on the provision of patient care and not management activities. This explanation is supported from a study done by Schommer and colleagues (2002) which found that pharmacists wanted to give less time to traditional management activities and more time to patient care activities.

Drug Therapy Management

The drug therapy management index (DTMI) was designed to measure the percentage of patients in a pharmacy who were provided specific services reflective of drug therapy management. Thus, the higher the DTMI score, the greater the number of services offered and percent of patients receiving those services. The theoretical score range for the DTMI is

15 to 90 with a mean for all pharmacies of 45.8 and an observed range from 17 to 76. It is not a surprise that no pharmacy scored 90 on the DTMI as researchers, including Cipolle, Strand and Morley (Cipolle, Strand, & Morley, 2003; Strand, Cipolle, Morley et al., 1991), have stated that not all patients require the highest level of activities within drug therapy management. The means for the three ownership categories for DTMI were similar (independently-owned = 49.2, health-system owned = 42.9 and corporately-owned chain = 49.4) with no significant differences across ownership categories when tested with a one-way ANOVA

Analytic Results

To test the possible relationships between the study variables, bivariate and multivariate analyses were completed. Research Aim 2 focused on the relationship between future time perspective and the three management variables. Research Aim 3 focused on the relationships among the management variables themselves.

Future Time Perspective

Prior research had found a positive relationship between FTP and strategic planning (Das, 1986) and futurity of decisions related to changes in practice models (Doucette & Koch, 2000). Thus, a positive relationship was hypothesized between FTP and SMI. The proposed relationship between FTP and OMI is based on prior research between FTP and strategic planning (Das, 1986). The hypothesized relationship between FTP and DTMI was based on the necessity of a reconceptualization of time for the provision of continuous, longitudinal patient care (Academy of Managed Care Pharmacy, 2002; Cipolle, Strand, & Morley, 2003; Hagel & Rovers, 2002). The hypotheses proposing a positive relationship between future time perspective and strategic, operational, and drug therapy management

were not supported by the bivariate or multivariate analysis. This is contrary to the expected results.

There are several potential explanations for the lack of significant relationships between FTP and these management activities. First, the question used to create the FTP measure used a generic referent that focused on personal experiences. It is possible that if the referent had been limited to work experiences specifically related the respondent's employing pharmacy the FTP measure would have been a better measure of the future time perspective of the pharmacy. Another possible reason for the lack of a significant relationship between future time perspective and the management activities is that the FTP measure previously had been utilized at the individual level of analysis. In contrast, study data were aggregated to the pharmacy to examine pharmacy's FTP.

Management Activities

Hypotheses proposing relationships between the management activities were significant for several of the bivariate and multivariate analyses. Bivariate analysis results show a significant positive relationship between all three pairings of SMI, OMI and DTMI. When multivariate models were constructed to reflect the ordering of these relationships as proposed in the research model, OMI was found to be a significant predictor of DTMI. Thus strategic management activities appear to have indirect effects on drug therapy management; it directly influences operational management activities which in turn influence drug therapy management activities. This is consistent with the conceptualization of the four functions of management and how they are related to one another (Daft, 1991; Griffin, 1990).

Control Variables

Pharmacy ownership, prescription workload, and pharmacist intensity were identified as control variables. Bivariate analysis identified several significant correlations between the control variables themselves and with study variables. Predictably, the three dummy-coded ownership variables were significantly correlated with each other and prescription workload and pharmacist intensity were significantly negatively correlated with one another.

Pharmacist intensity had a significant negative relationship with the strategic management index. Independent ownership was significantly negatively correlated with strategic management index. Corporate-chain ownership had a significant positive correlation with both strategic and operational management. None of the dummy-coded ownership variables was significantly correlated with the drug therapy management index.

When these relationships were examined as proposed in the research model, corporate -chain ownership, prescription workload, and pharmacist intensity as a group were significant predictors of SMI. Corporate-chain ownership had a positive relationship with SMI while prescription workload and pharmacist intensity each had a negative relationship with SMI. As discussed previously, because corporate-chain pharmacies are part of larger organizations, strategic management activities may be institutionalized into the process and procedures of the larger organization. The negative relationship between prescription workload and the strategic management index may reflect pharmacists focus on accurate prescription dispensing. The negative relationship between pharmacist intensity and SMI shows that as the percentage of pharmacist time to total staff hours increases, the less strategic management activities are being performed.

IMPLICATIONS

The research findings concerning future time perspective and management activities of community pharmacy organizations relate to the theoretical background described in Chapter 2. The community pharmacies represented in this study were all involved with the University of Wisconsin-Madison School of Pharmacy's Experiential Learning Program. This group represents a select group within the approximately 1100 licensed pharmacies in the State of Wisconsin. These pharmacies are involved in providing education and training to pharmacy students in the last year of the Doctor of Pharmacy curriculum. Therefore, the goal of the faculty involved in the Experiential Learning Program is to have community pharmacies participate in education and training of pharmacy students and focus on the development and refinement of students' drug therapy management skills.

Future Time Perspective

There were no significant relationships between future time perspective and strategic, operational or drug therapy management. In contrast, previous research found a positive relationship between future time perspective and strategic planning (Das, 1986; El Sawy, 1983) using a personal referent for the measure. The future time perspective measure for this study also used a personal referent for the measure. It is possible that pharmacists may use different time perspectives based on the personal, work or professional referents. Therefore, if this measure is used in future research, rewording with a focus on the work setting would be recommended. In addition, future work could examine several other time constructs, such as temporal depth and temporal focus, both of which include a past and future orientation. This may be useful to use in future research based on findings by El Sawy (1983) where the further executives looked back, the further into the future they also looked.

Strategic, Operational and Drug Therapy Management

Results of the fitted regression models show positive relationships between strategic management, operational management, and drug therapy management. The positive relationships identified in the fitted models are supported by research in the management literature (Shuman & Seeger, 1986; Woods & Joyce, 2003) and by the one study in the pharmacy literature (Doucette & Koch, 2000). When a community pharmacy's culture values and promotes strategic management activities, this is associated with operational activities also being done with more of an orientation toward the future. This in turn, is associated with the culture of time related to the provision of patient care services such as drug therapy management which requires a longitudinal perspective toward patient care.

It is intriguing to explore further the relevance of strategic and operational management activities to the provision of drug therapy management. With pharmacists stating that they want to perform less management activities (Schommer, Pedersen, Doucette et al., 2002), additional research should build on the current study's findings related to the relevance of strategic and operational management in the provision of drug therapy management. In addition, dissemination and application of these findings to current pharmacy practitioners is important in establishing the relationship between managing the pharmacy and drug therapy management. A challenge for current pharmacy practitioners, many whom are working in pharmacies that are not fully staffed, is incorporating strategic and operational management activities into their daily practices. Corporate-chain owned pharmacies appear to be doing a better job in providing the structure and processes related to the strategic management activities. Strategic management research has shown that small businesses such as independently-owned pharmacies are less likely to have a formalized

strategic management process than medium and large businesses. Health-system owned pharmacy may have yet a third type of organizational structure that may require even different approaches to the provision of strategic management activities. Therefore, based on the ownership structure of the pharmacy, different approaches to applying the concepts of strategic management may be necessary.

Current educational guidelines developed by ACPE for accreditation for schools and colleges of pharmacy already include requirements specifically focused on pharmacy practice management (American Council on Pharmaceutical Education, 1997). Yet, previous research related to management activities in pharmacy practice has shown that a majority of pharmacies do not do strategic management (Harrison & Ortmeier, 1996) and that many pharmacists would prefer to spend less time on management activities (Schommer, Pedersen, Doucette et al., 2002). Therefore, the importance of strategic management and operational management to successful provision of drug therapy management services seems to be lacking in pharmacies. Because the pharmacies in this study are involved in the Experiential Learning Program, pharmacy students are experiencing first hand the disconnect between the relevance of strategic and operational management to the provision of drug therapy management. It may be necessary, based on the significant findings related to strategic and operational management to the provision of drug therapy management services of this study, for ACPE and educational institutions to re-evaluate how strategic and operational management activities can be made relevant to the successful provision of drug therapy management in both didactic and experiential learning experiences.

STUDY LIMITATIONS

Interpretation of the results requires acknowledgement of several study limitations. These include the use of cross-sectional design, the sampling frame, overall sample size, generation/adaptation of measures and data aggregation processes. Each has implications for generalizability of study findings.

The use of cross-sectional design does not allow true causal relationships to be established. Empirical relationships of association were demonstrated, though future research must include longitudinal work to learn more about the causal paths between strategic, operational and drug therapy management. Adoption of new practice models is a dynamic process and occurs in stages (Rogers, 1995). Cross-sectional data provide a snapshot of what was occurring when the data were collected. Therefore, it is possible that pharmacies in the sample were in various stages of implementing and providing drug therapy management services. Future work using longitudinal designs should examine stages of adoption and changes in management activities.

The sampling frame is a second limitation of the study. Choosing to study community pharmacies involved with the UW SOP Experiential Learning Program was done to increase the probability of including pharmacies providing higher levels of drug therapy management services. Pharmacies/pharmacists opting into the ELP, potentially reflect different motivations, interests and activities when compared to non-ELP pharmacies. In addition, the pharmacist preceptors at these pharmacies received preceptor training which established expectations for their role and their pharmacy's role in the student's learning. Thus, pharmacies involved in ELP may be different from the rest of the community pharmacies in the State of Wisconsin. If a random sample of community pharmacies was

utilized for this study, results may have been different. Generalizability of the results of this study is limited to pharmacies involved in the experiential learning program.

Sample size is the third limitation of this study. In organizational research sample sizes tend to be small when examining teams and organizations. For example Onken (1998) used 20 companies in her study in her study of temporal aspects of organizational culture on firm performance. In this project, a balance was sought to achieve a feasible design while providing adequate statistical power. Fifty pharmacy managers of the 73 contacted (70% participation rate) completed the telephone interview in Stage 1 of the data collection process. Non-response to the mail questionnaire in Stage 2 of the study is the major reason for loss of 11 pharmacies and hence, the final sample size of 39 pharmacies. A decrease in the dropout rate would have kept more pharmacies in the study for analysis and by definition, increased the stability of the findings.

Some instrumentation and measurement issues were also a concern. Prescription workload and pharmacist intensity may not have captured the full extent of their meanings. Prescription workload only took into account the number of prescriptions a pharmacist was responsible for in a typical hour of work. It did not recognize fluctuations in workload nor did it account for problems in the processing of a prescription, either technical (e.g., insurance problems) or therapeutic (e.g., drug interactions, duplicate therapy, patient concerns about medication). Such technical and therapeutic problems increase the total physical and cognitive workload on all staff members. Related to this, the prescription workload does not take into account the patient base of the pharmacy – that is, whether the pharmacy has high percentage of patients with complicated drug therapies (e.g., HIV/AIDS patients, cancer patients, etc.) and/or provides more acute care services. More direct

assessment of overall workload would provide a better estimation of pharmacists' physical and cognitive workload. Pharmacist intensity was defined as the proportion of pharmacist hours to total staff hours (pharmacists and technicians) and provides a general picture of where staff hours are allocated. Its limitations are similar to those affecting the workload measure. Importantly, it does not address the adequacy of staff allocation for the provision of drug therapy management services. Future research is needed to explore methods for more comprehensive measurement of pharmacist intensity and what standards, if any, can be set for pharmacist intensity.

Key measurement issues relate to the future time perspective measure and construction of the strategic and operational management indexes. The future time perspective measure used a generic referent. None of the future time perspective hypotheses were supported by the data. As discussed previously, it is possible that pharmacists' time perspectives vary with regard to situation or area of life (i.e., personal, work, professional). There are also issues related to the construction of the strategic and operational management indexes. The management literature and colleagues (i.e., pharmacy faculty and practitioners) were utilized in the development of the index measures. It is possible that activities relevant to each index were left out; if so, this would impact the construct validity of the measures (Diamantopoulos & Winklhofer, 2001). Further examination of the measures may be necessary to ensure that all relevant elements of each index were included and to establish validity and reliability.

Lastly, there are limitations related to aggregation of the data. Data aggregation allowed analysis to be conducted on pharmacies and not individual pharmacists. Pharmacists within a pharmacy differ by position (i.e., pharmacy manager and staff pharmacists) and have

differing levels of responsibility for the pharmacy based on state and federal laws and regulations as well as pharmacy-specific and policies and procedures, especially if the pharmacy is part of a larger organization. In aggregating the data, differences between the pharmacy managers and staff pharmacists are not taken into account. These differences may be significant and may have resulted in different results if taken into account in the analysis.

FUTURE DIRECTIONS

Findings of this study, in addition to its strengths and limitations, point to a number of areas that warrant additional research. Some of these link directly to future time perspective and management activities in community pharmacy practice; others suggest related, but important questions regarding professional socialization and differences between management and staff members.

Initially I considered including in this study additional conceptions of time (e.g., polychronicity, temporal depth, temporal focus). The concept of future time perspective proved to have sufficient complexity to examine on its own, however. The non-significant relationship future time perspective had in this study, the examination of additional measures of time seems appropriate, specifically the concepts of temporal depth and temporal focus in relation to both pharmacy and patient management activities. El Sawy (1983) found that the further into the past individuals evaluate, the further into the future they will evaluate when making decisions. So, too, it may be that a longer "past time perspective" facilitates a longer future time perspective and influences the culture in such a way that supports the provision of drug therapy management activities.

Professional education and socialization of pharmacy students and pharmacists is an area that the profession has grappled with for many years. Current pharmacy education is focused on developing pharmacy practitioners skilled in the provision of drug therapy management. This includes teaching in such diverse areas as medicinal chemistry, pharmacotherapy, communications, and pharmacy management. With drug therapy management's focus on continuous, longitudinal patient care, it is seems important to incorporate this longitudinal aspect across the pharmacy curriculum. In addition, does socialization throughout the curriculum alter student's time perspective? A longitudinal panel study following a group of students through the curriculum would help to examine if socialization in a professional pharmacy curriculum alters students time perspectives.

Data were aggregated to the pharmacy level. Returning to the individual level of analysis would allow the examination of differences, if any, there are between pharmacy managers and staff pharmacists. Do legal responsibilities and positional differences influence the strategic, operational and drug therapy management activities that pharmacists are involved in? Also, how do perceptions of, and activities, related to strategic, operational and management activities vary within pharmacies? Do these differences result in organizational cultures that are integrated, differentiated or fragmented based on Martin's (1992; 2002) typology of organizational culture?

Adoption of the principles of drug therapy management by leaders and educators of the pharmacy profession began in the early 1990s. These principles are being adopted only slowly at the grass roots level of pharmacy practice. Why? This study found that strategic management is a significant predictor of operational management and that operational management is a significant predictor of drug therapy management. Thus, the more forward

looking pharmacies are regarding strategic and operational management, the more drug therapy management services are provided to a larger patient population. This is consistent with assertions by several pharmacy researchers (e.g., Cipolle, Strand, & Morley, 1998; 2003; Hagel & Rovers, 2002; Holland & Nimmo, 1999a,1999c; Nimmo & Holland, 1999b-a,1999d,2000) that strategic and operational management are important to the provision of drug therapy management. Thus, it is important to the pharmacy profession that current and future pharmacists begin to engage in, or at least have an awareness of, the necessity of strategic and operational management and their relevance to the provision of drug therapy management. Pharmacy's leadership groups need to take responsibility for helping current and future pharmacists begin to value strategic and operational management activities as the framework that supports the provision of drug therapy management services. Groups that specifically should take leadership roles in advocating for and helping others learn about the value of management activities as related to patient care include the National Community Pharmacists Association, the National Association of Chain Drug Stores, the American Pharmacists Association, the American Society of Health-System Pharmacists, the Academy of Managed Care Pharmacy, the American Council on Pharmaceutical Education and the American Association of Colleges of Pharmacy. The first five associations all provide resources to managers and staff pharmacists in each of the settings that they represent. Due to the differences found across ownership categories on strategic and operational management, these organizations seem a logical group to take a leadership role in helping their members see the value of all management activities. The last two associations, the American Council on Pharmaceutical Education and the American Association of Colleges of Pharmacy, can take a leadership role with schools and colleges of pharmacy regarding

curriculum guidelines and how faculty can incorporate and teach the value of all types of management activities. This will help provide an integrated framework of management that supports pharmacy's future as one focused on providing high quality drug therapy management..

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APPENDIX A: PHARMACY RECRUITMENT PACKET

August 20, 2002

«First_Name» «Last_Name», Pharmacy Manager
«Pharmacy_Name»
«Address»
«City_», «St» «Zip»

Dear Pharmacist «Last_Name»:

In today's fast paced environment of community/ambulatory pharmacy practice, patient-care and management routines have been changing. We are conducting a study to learn more about the changes in these areas of contemporary pharmacy practice. By focusing on patient-care and management routines, we hope to learn two things: (1) how pharmacists and pharmacies think about these routines and their relationship to various concepts of time, and (2) to identify the activities involved in contemporary pharmacy practice.

We need your help. Your pharmacy has been chosen to participate in this study based on your involvement with the UW School of Pharmacy's Experiential Learning Program (ELP). Within the next two weeks, we will contact you by telephone to ask you to participate in this study. At that time we will ask you to schedule a time for a telephone interview that will take approximately 25 minutes to complete. It will be used to obtain basic information about your pharmacy, including the names of pharmacists, residents and interns who work at your pharmacy. Following the telephone interview, we will send you a packet containing questionnaires for you and your pharmacists to complete.

Included with this letter is a description of our study. We encourage you to read it and hope that it will answer questions you might have about the study or about your participation in it. Please keep this so that if you have any questions (now or later) about this study, you can call or write to us at the School of Pharmacy. Allow us to highlight several important points.

- Any information that you provide to us will be treated confidentially.
- By agreeing to complete the telephone interview, you are indicating that you consent to participate in the study.
- If you wish to skip a question during the interview, that is your choice to make.
- If you do not wish to be contacted to participate in this study, please return the enclosed postcard by August 27th and we will not contact you again.

Thank you very much for your assistance. We look forward to talking with you soon.

Jeanine K. Mount, PhD, RPh
Associate Professor
Phone: 608-262-8678
jkmount@pharmacy.wisc.edu

Mary K. Gurney, MS, RPh
Doctoral Candidate
Phone: 608-262-4723
mkgurney@pharmacy.wisc.edu

August 20, 2002

«First_Name» «Last_Name», Pharmacy Manager
«Pharmacy_Name»
«Address»
«City_», «St» «Zip»

Dear Pharmacist «Last_Name»:

Professor Jeanine Mount and Mary Gurney, a PhD student, currently are conducting a study of community/ambulatory practice in Wisconsin pharmacies. Their study focuses on clerkship sites that are involved in our School's Experiential Learning Program.

I anticipate that their research will provide information that is beneficial to pharmacy and helpful to the Experiential Learning Program. I am hopeful that you will be able to assist them with this project.

Thank you for your continued support of our School of Pharmacy.

Sincerely,

Mel Weinswig, PhD, RPh
Dean and Professor

STUDY DESCRIPTION

INVITATION

You and your pharmacy are invited to participate in a study conducted by researchers at the University of Wisconsin (UW) School of Pharmacy to learn more about management and patient care routines in contemporary community/ambulatory pharmacy practice. Your pharmacy was selected based on your pharmacy's involvement with the School of Pharmacy's Experiential Learning Program. Your participation is voluntary.

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to (1) explore how pharmacists think about time in relation to patient-care and managerial aspects of pharmacy practice and (2) to identify the models of care pharmacies and pharmacists currently use in their practices.

WHAT IS BEING DONE?

We will obtain information from licensed pharmacists, residents and interns at community pharmacies that participate in the UW School of Pharmacy's Experiential Learning Program (ELP). A telephone interview (lasting approximately 25 minutes) with the pharmacy manager will provide basic information about the pharmacy and identify licensed pharmacists, residents and interns who work at the pharmacy. After that telephone interview, a packet of materials will be sent to the pharmacy manager. The packet will contain paper-and-pencil questionnaires addressed to individual members of the pharmacy's pharmacist staff, each of who will be asked to complete and return the questionnaire. Completion of questionnaire by pharmacist staff will be voluntary (i.e., cannot be required by the researchers or the pharmacy manager) and will take approximately 20 to 30 minutes.

WHAT WILL MY PARTICIPATION INVOLVE?

If you are the Pharmacy Manger, you will complete a telephone interview (lasting approximately 25 minutes) and a follow-up questionnaire (taking approximately 20 to 30 minutes).

If you are not the Pharmacy Manager, you will complete a questionnaire that will take approximately 20 to 30 minutes.

ARE THERE ANY BENEFITS?

Copies of study reports will be sent to participating pharmacies and shared with staff in the

Experiential Learning Program. Otherwise there are no immediate benefits to individuals for participating in the study.

ARE THERE ANY RISKS?

The risks associated with participating are minimal and include only the potential for a breach in confidentiality. In the section below, the protection of confidentiality is described. Participation is completely voluntary. Data gathering will be scheduled so as to minimize disruption of work routines. All data will be collected and handled only by the investigators who are responsible for this study. Data included in study reports will be presented in aggregated form only; respondents (as individuals) and pharmacies (as sites) will remain anonymous. No individually-identifiable information will be given to pharmacies that have participated in the study or to faculty involved in the Experiential Learning Program.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

No information about individual respondents or individual pharmacies will be released. Each questionnaire will contain a code number to identify the individual respondent and the pharmacy where he/she works. This will be used to allow tracking of response and to ensure an accurate description of activities occurring at the pharmacy. All codes will be stored in a locked file and kept separate from the information collected. Upon completion of the study, lists with names and code numbers will be destroyed.

IF I DECIDE TO START THE STUDY, CAN I LATER CHANGE MY MIND?

If you decide to participate, you may change your mind at any time. Your decision of whether or not to participate in this study will not affect any relationship you might have with the University of Wisconsin School of Pharmacy Experiential Learning Program. Your decision to participate in this research is entirely voluntary.

IF I DECIDE NOT TO PARTICIPATE WHAT DO I DO?

Your decision to participate in this research is entirely voluntary. If you choose not to participate, please return the enclosed "opt-out" postcard within 1 week of receiving this information and we will not contact you again.

WHAT IF I HAVE QUESTIONS?

If you have questions about this research please contact Mary K. Gurney, MS, RPH (telephone: 608-262-4723; email: mkgurney@pharmacy.wisc.edu) or Jeanine K. Mount, PhD, RPH (telephone: 608-262-8678; email: jkmount@pharmacy.wisc.edu), both at the University of Wisconsin-Madison, School of Pharmacy, 777 Highland Ave., Madison, WI 53705.

Dear Investigators:

I have decided to opt-out of participation in the study.

_____

APPENDIX B: PHARMACY MANAGER TELEPHONE INTERVIEW

PHARMACY MANAGER TELEPHONE INTERVIEW

Script To Obtain Informed Consent - Verbal

Hello. My name is Mary Gurney and I am a graduate student at the University of Wisconsin School of Pharmacy. Is (pharmacy manager name) in? May I please speak with him/her?

I am calling to talk with you about your possible participation in this study. Would you have a few minutes to talk right now about participating in the study or would there be a better time for me to talk with you?

If YES, begin with question about receiving the letter of invitation.

If NO, schedule time to call back to talk with pharmacy manager about participating in the study.

I would like to ask if you received the letter inviting you and your pharmacy to participate in this study?

If they did not receive information: ask if they would like me to resend it in the mail, email or fax it to them? Then offer to re-contact them in a few days.

If they did receive information: I would like to remind you of some important information concerning the study. This information was included in the study presentation that accompanied my letter to you.

The University of Wisconsin-Madison School of Pharmacy is currently conducting a study to learn more about patient-care and management routines in contemporary community/ambulatory pharmacy practice. We hope to learn two things: (1) how pharmacists and pharmacies think about these routines and their relationship to various concepts of time, and (2) to identify the activities involved in contemporary pharmacy practice.

There are two phases of the study. The first involves an interview with the pharmacy manager, which is what I am contacting you about today. In the second phase, paper-and-pencil questionnaires will be sent to you and also to members of your pharmacist staff to complete.

You are being invited to participate in this study because your pharmacy is involved in the School of Pharmacy's Experiential Learning Program. Your participation and your staff's participation in this study is completely voluntary. Non-participation will not affect your pharmacy's relationship with the School of Pharmacy's Experiential Learning Program. By agreeing to participate in the study, you are providing consent for **your own** participation in the study and to allow the researchers to contact your pharmacist staff. Your pharmacist staff members will retain their individual right to consent, or to decline, to participate in this study. Any information you provide will be treated confidentially. If you wish to skip questions during the interview you may do so. If you change your mind about participating, you are free to withdraw at any time.

Do you have any questions or concerns about the study at this time?

IF YES, answer questions and then ask if they are willing to participate in the study at this time. Document verbal consent given with date and time and who provided consent.

IF NO, ask if they are willing to participate in the study at this time. Document verbal consent with date, time and who provided consent.

Verbal Consent Obtained: YES _____ NO _____ Date _____ By_____

Introduction/Reminder to subject if interview not completed at initial contact

Thank you for taking the time to complete this interview.

There are a few items I would like to remind you of before we begin the interview.

- Your participation in the study is voluntary.
- Any information that you provide to us will be treated confidentially
- If you wish to skip questions during the interview, you may do so.
- If you change your mind about participating, you are free to withdraw at any time.

Are you ready to start?

Interview Questions

I know you are the manager at _____ Pharmacy.

1a. _____1a. IF NOT SURE OF OWNERSHIP TYPE, ASK:
What is the ownership structure of the pharmacy?
(Prompt: For example single ownership, franchisee, multi-owner, etc).

1. Independent - single owner
2. Independent - multi-owner
3. Franchisee
4. Small chain
   □ # stores _____
5. Co-operative
6. Health-System
7. Corporate chain
8. Other

1b _____ 1b. In what type of setting or location is your pharmacy located?
(Prompt: For example, are you located in a strip mall, in a grocery store, in a clinic?).

1. Stand alone
2. Grocery Store combo
3. Clinic
4. Other _____

2. _____2. IF A KNOWN CORPORATE STORE, in what type of setting or location is your pharmacy located?
(Prompt: For example, is it a traditional stand alone store, grocery store combo or another type of setting?)

1. Stand alone
2. Grocery Store combo
3. Clinic
4. Other _____

3. _____3. In addition to prescription dispensing, is your pharmacy involved in providing any other types of pharmacy services?
(Prompt: such as servicing nursing homes or group homes, preparing home infusion therapy).

1. Home IV
2. Hospice
3. Nursing Home
4. Group Homes
5. Other _____

4. _____4. What is the average weekly prescription volume for your pharmacy? Include only outpatient prescriptions.
(Prompt: If pharmacy serves group homes, please include group home prescriptions)

5a1_____5a. What are your pharmacy's daily hours of operation for the week for the professional services area?
(Prompt: Monday thru Friday, Saturday and Sunday)

5a2_____ Mon - Fri _____

Saturday _____

Sunday_____

5a1 = total hours open

5a2= Availability Nights and Weekends
1. No sat and sun
2. Saturday only
3. Saturday and Sunday

5b _____ 5b. IF NOT A 24-HOUR PHARMACY, ASK:
Is the pharmacy staff at your pharmacy available outside regular working hours for emergencies?
_____ NO (0)
_____ YES (1)

5c_____5c. IF YES: How are patients able to contact the pharmacist for emergencies?

1. Other stores
2. Pager
3. On Call

As I indicated earlier, in the next phase of the study we will be contacting the licensed pharmacists, pharmacy residents and interns who are working at your site. To be able to do that, we need to obtain the names of the these individuals.

6. What are the names of each of the licensed pharmacists (including yourself) who work at your pharmacy and about how many hours per week does each work on average?

	a) Name (Number of staff)	b) Hours per week (FT(1)/PT(2))
6a _____		
6b _____	_____	_____
6b2_____	_____	_____
6b3_____	_____	_____
6b4_____	_____	_____
6b5_____	_____	_____
6b6_____	_____	_____
6b7_____	_____	_____

7a. _____ 7. What are the names of each of the pharmacy residents, interns

7b: Resident = 1; Intern = 2; Clerkship = 3

and clerkship students currently working at your pharmacy and about how many hours per week does each work on average?

	7a. Name (Number)	7b.Resident/Intern	7c. Hours per week
7b1_____	_____	_____	7c1 _____
7b2_____	_____	_____	7c2 _____
7b3_____	_____	_____	7c3 _____
7b4_____	_____	_____	7c4 _____
7b5_____	_____	_____	7c5 _____
7b6 _____	_____	_____	7c6 _____

I would also like to learn about the technicians, clerks and other personnel who work in the pharmacy.

8a _____ 8a. First, how many technicians work in your pharmacy? By technician, I mean, all non-pharmacist personnel who are involved in prescription processing.

8b _____ 8b. How many of the technicians work full-time? _____
What is the average number of hours each works per week?
Are any of them Certified Pharmacy Technicians?

	Technician	8b1 Hours	8b2 CPhT	(0 = no; 1 = yes)
8b11_____	Number #1_____	_____	_____	8b21 _____
8b12_____	Number #2_____	_____	_____	8b22 _____
8b13_____	Number #3_____	_____	_____	8b23 _____
8b14_____	Number #4_____	_____	_____	8b24 _____
8b15_____	Number #5_____	_____	_____	8b25 _____

8c. How many of the technicians work part-time? _____
What is the average number of hours each works per week?
Are any of them Certified Pharmacy Technicians?

	Technician	8c1 Hours	8c2 CphT	(0 = no; 1 = yes)
8c11 _____	Number #1_____	_____	_____	8c21 _____
8c12 _____	Number #2_____	_____	_____	8c22 _____
8c13 _____	Number #3_____	_____	_____	8c23 _____
8c14 _____	Number #4_____	_____	_____	8c24 _____
8c15 _____	Number #5_____	_____	_____	8c25 _____

8. In general are the pharmacy technicians involved in doing::
(See table)

Activity	No (0)	Yes - some of the time (1)	Yes - all the time (2)
8d. Order entry			
8e. Making generic substitution decisions			
8f. Reconstituting medications (e.g., oral liquids, Benzamycin)			
8g. Calling prescribers for refill authorizations			

Next, I would like to ask about clerks and other personnel who work in the professional services area on a scheduled basis and ARE NOT involved in prescription processing. Please include store personnel who get "pulled" into the pharmacy on occasion.

9a. _____ 9a. How many of these clerks or other personnel work full-time? _____

What is the average number of hours each works per week?

	Clerk/Other Personnel	Hours
9a1 _____	Number #1	_____
9a2 _____	Number #2	_____
9a3 _____	Number #3	_____
9a4 _____	Number #4	_____
9a5 _____	Number #5	_____

9b. _____ 9b. How many of the clerks or other personnel work part-time? _____

What is the average number of hours each works per week?

	Clerk/Other Personnel	Hours
9b1 _____	Number #1	_____
9b2 _____	Number #2	_____
9b3 _____	Number #3	_____
9b4 _____	Number #4	_____
9b5 _____	Number #5	_____

9c. What types of activities do they perform related to the pharmacy?
(Prompt: cashier, third party billing/insurance; bookkeeping, etc.).

9d _____ 9d. How many hours do they spend in pharmacy related activities?

Question 10a: Are there any other health care professionals who provide services to your patients in your pharmacy? (Prompt: visiting nurses; immunizations, chiropractor, dietician, etc.)	**Question 10b**: How frequently are they at the pharmacy?	**Question 10c**: What types of activities is each of these individuals involved?
1.		
2.		
3.		
4		

11. Is there a minimum and maximum technician:pharmacist staffing ratio that you try to maintain in the pharmacy? What is the minimum ratio you try and maintain? What is the maximum ratio you try and maintain?

Next, I would like to learn about the workflow and prescription processing in your pharmacy.

12a. How does workflow in your pharmacy work? Would you describe it to me?

12b. Does your pharmacy have a standard workflow in place for guiding the work of prescription processing?
_____NO ➜ Skip to QUESTION 12G
_____YES

12c. How does the staff learn the workflow process in the pharmacy? Is the description written down as a policy or procedure? Or is it that the staff are trained in the workflow process?

____ NO
____ INFORMAL
____ FORMAL

12d How consistently is the workflow used?

12e. How much does the workflow process differ when different pharmacists are on duty?

12f. What happens to workflow when you get busy?

12g. Do you schedule pharmacists to be off-line (in non-prescription processing activities) to do clinical or developmental (i.e., research, training, etc.) activities related to the provision of clinical services?

_____ NO ➜ Skip to QUESTION 13
_____ YES

12h. If YES, how many hours a week are pharmacists scheduled in off-line activities?

12i. What kinds of clinical or developmental activities are they involved in?

READ QXs 13a-n FOR PHARMACIES THAT ARE NOT OWNED BY LARGE CORPORATIONS (e.g. INDEPENDENTLY OWNED, SMALL GROUP OWNERSHIPS OR CO-OPERATIVES).

My next questions focus on the management and operations of your pharmacy.

13a. Pharmacies that are not part of a large corporation have opportunities to be involved in buying groups, franchise arrangements or other administrative/buying relationships. Is your pharmacy involved in any of these types of arrangements?
(Prompt: Such as IPC, Medicine Shoppe, HealthMart, ValueRite, Good Neighbor Pharmacy)

____ NO

____ YES → What are the organizations and what services do they provide?
(Prompt: Inventory management, financial management, administrative support)

Organization	Service(s)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Next, I am interested in finding out who has responsibility for several areas of decision-making in your pharmacy.

13b. Who has the responsibility for hiring pharmacists for your pharmacy?

13c. If responsibility is shared: Where does primary responsibility lie?

13d . Who has the responsibility for hiring technicians for your pharmacy?

13e. If responsibility is shared: Where does primary responsibility lie?

13f. Who has the responsibility for deciding staffing levels?

13g If responsibility is shared: Where does primary responsibility lie?

13h. Do you have the authority to alter staffing levels at your pharmacy based on what you perceive the site's needs to be?

13i. Who has the responsibility for creating the budget and setting the financial targets or goals for the pharmacy?

13j. If responsibility is shared: Where does primary responsibility lie?

13k. Who produces the financial reports for your pharmacy?
(Prompt: for example, monthly or quarterly operating statements, profit and loss statements)

13l. If responsibility is shared: Where does primary responsibility lie?

13m. Who formally reviews the financial reports?

13n. Do the pharmacists in the pharmacy review the financial reports? Which reports do the pharmacists review?

---------- SKIP TO QUESTION 15 ----------

READ QUESTIONS 14a-m FOR CORPORATELY OWNED PHARMACIES ONLY.

My next questions focus on several areas of decision-making in your pharmacy. Corporately-owned pharmacies often have several levels of management. For the following questions, which level of management (for corporate chains – store, district, regional, national; for health-system – site, region or area, home office) has responsibility for this area of decision-making related to your pharmacy?

14a. Which level of management has responsibility for hiring pharmacists for your pharmacy (cc - store, district, regional, national; hs - site, region/area, home office)?

14b. If responsibility is shared across levels: Where does primary responsibility lie?

Follow-up:
Is there a specific individual who holds that responsibility? (By that I mean name or title.)

14c. Which level of management has responsibility for hiring technicians for your pharmacy (cc - store, district, regional, national; hs - site, region/area, home office)?

14d. If responsibility is shared across level: Where does primary responsibility lie?

Follow-up:
Is there a specific individual who holds that responsibility? (By that I mean name or title.)

14e. Which level of management decides on the staffing levels for the pharmacy (cc - store, district, regional, national; hs - site, region/area, home office)?

14f. If responsibility is shared across levels: Where does primary responsibility lie?

Follow-up:
Is there a specific individual who holds that responsibility? (By that I mean name or title.)

14g. Do you have the authority to alter staffing levels at your pharmacy based on what you perceive the site's needs to be?

14h. Which level of management is responsible for creating the budget and setting the financial targets or goals for the pharmacy (cc - store, district, regional, national; hs - site, region/area, home office)?

14i. If responsibility is shared across levels: Where does primary responsibility lie?

Follow-up:
Is there a specific individual who holds that responsibility? (By that I mean name or title.)

14j. Which level(s) of management is responsible for producing financial reports for your pharmacy (cc - store, district, regional, national; hs - site, region/area, home office)?

14k. If responsibility is shared across levels: Where does primary responsibility lie?

Follow-up:
Is there a specific individual who holds that responsibility? (By that I mean name or title.)

14l. Which level(s) of management formally review the financial reports (cc - store, district, regional, national; hs - site, region/area, home office)?

14m. Do the pharmacists in the pharmacy review the financial reports? Which reports do the pharmacists review?

15. I would like to learn more about administrative activities in your pharmacy. For each of the following

administrative activities, which person or persons is responsible for that activity?

Responsibility	Who does it
a. Scheduling	_____
b. Inventory Control	_____
c. Third party contract review	_____
d. Selecting/upgrading computer systems	_____
e. Selecting vendors	_____
f. Third party reconciliation	_____
g. Ordering stock	_____
h. Staff training	_____

16. Are there any other key administrative tasks or activities that are important for your pharmacy?

_____ NO

_____ YES ➜What are those tasks/activities and who is responsible for each?

Task/Activity	Who does it
_____	_____
_____	_____
_____	_____
_____	_____

17a. If you wanted to start a new patient care service at your pharmacy, do you have the authority to do so? (Prompt: such as immunizations, monitoring program, etc).

17b. With your current personnel and staffing level, how feasible would it be to start a new service?

17c. If you had an idea for a new patient care service, what would be the first thing you would do to start this new service?

17d. What would be the second thing you would do?

17e. What would be the third thing you would do?

I would like to finish with some brief questions about you in your position as pharmacy manager.

18. How long have you WORKED at this pharmacy?

_____ Years OR Since _____

19. How long have you been the PHARMACY MANAGER at this pharmacy?

_____ Years OR Since _____

20. Have there been any significant managerial or ownership changes at the pharmacy in the past year?
____ NO
____ YES →Please describe.

21. Do you have any ownership interest in the pharmacy?
(Prompt: Are you the owner, part owner or a stockholder?)

22. Have you been in management or an owner at another pharmacy?

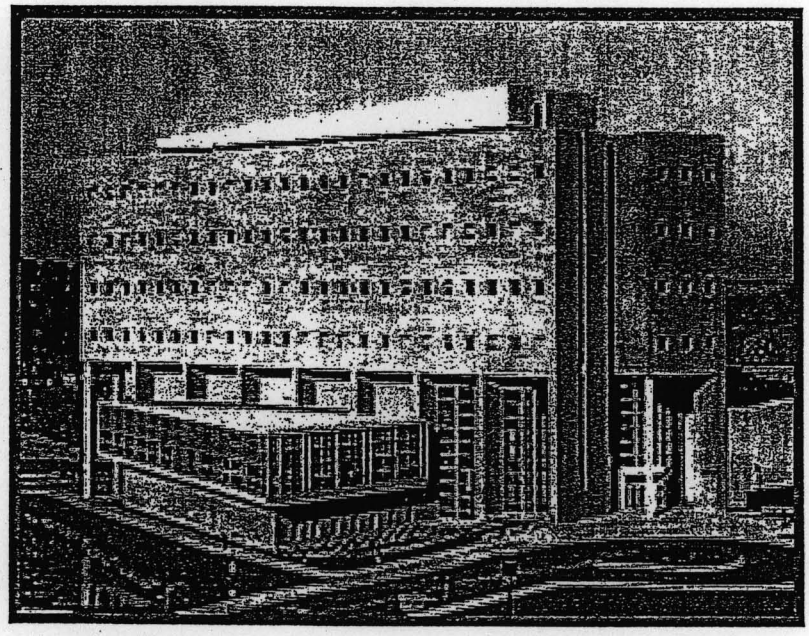
23. Have you had any type of training in management, such as classes, degree training programs. etc.?
____ NO
____ YES →Please describe.

Thank you for participating in the interview. I would also like to remind you that the packet containing the questionnaires for you and the pharmacists will be sent out within the next week.

My notes and reflections:

APPENDIX C: PHARMACY MANAGER SURVEY

A STUDY OF COMMUNITY PHARMACY PRACTICE SITES: Patient Care and Management Activities



Rennebohm Hall

I. Patient Care Activities

1. First we would like to learn about various patient care activities that you perform in your pharmacy practice. This page lists various activities that a pharmacist might carry out during his or her workday. For each task, we would like to know two things. For each item, respond to the questions at the top of each column, using the response codes that follow. If a particular item does not apply to you, simply skip it.

	HOW IMPORTANT DO YOU FEEL THAT THIS TASK IS? Unimportant = -2; Somewhat Unimportant = -1; Not Important or Unimportant = 0; Somewhat Important = +1; Important = +2; Very Important = +3; Crucial = +4							FOR APPROXIMATELY WHAT PERCENT OF YOUR PATIENTS DO YOU ACTUALLY DO THIS TASK? 0% to 5% = ≤5; 5% to 20% = 5-20; 20% to 40% = 20-40; 40% to 60% = 40-60; 60% to 80% = 60-80; 80% to 100% = ≥80					
a. Taking responsibility for identifying my patient's drug-related problems. .	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
b. Getting essential clinical data from my patient (e.g., illnesses, therapy, complaints or symptoms).	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
c. Entering and/or interpreting clinical information	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
d. Screening for drug allergies, interactions, duplication, etc.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
e. Checking the work of pharmacy technicians	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
f. Preparing manufactured medications for dispensing	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
g. Preparing compounded medications for dispensing	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
h. Composing a list of drug-related problems	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
i. Deciding (with my patient) which alternative therapy is best	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
j. Informing my patient about his/her medications, their use, side effects, etc.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80

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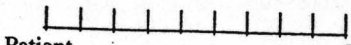
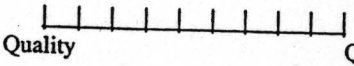
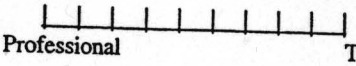
k. Assessing my patient's understanding on every new medication they receive	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
l. Assessing my patient's experience with their medications with every first refill	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
m. Designing a therapeutic drug-monitoring plan that looks at adverse effects	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
n. Evaluating whether desired outcomes are being achieved.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
o. Intervening to adjust my patient's medication regimen.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
p. Follow-up on therapy and outcomes on a long-term basis	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
q. Documenting counseling, interventions and observations ...	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
r. Encouraging the use of compliance aids to my patients with complex problems (medication regimens) .	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
s. Performing disease management for certain groups of patients with the same disease or problem	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
t. Performing special services (e.g., blood pressure checks, glucose monitoring etc.)	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80

Next we would like to learn about your pharmacy practice site.

2. How would you describe your site in terms of its: (Place **CHECK [✓]** on line)

a. Orientation: 
Patient Product

b. Focus: 
Quality Quantity

c. Pharmacist's work: 
Professional Technical

3. Does your pharmacy:

a. provide immunizations (e.g., influenza, pneumococcal, etc)? ____NO ____ YES

b. bill for cognitive services (e.g., extended counseling, problem solving)? ____NO ____ YES

c. have a patient education center/area? ____ NO _____ YES

1. If YES, How large is the area (i.e. square feet or shelf space) _____

2. What types of materials are available for use? (Check **ALL** that apply)
   _____ Books
   _____ Videos
   _____ Pamphlets
   _____ Computer with internet access
   _____ Other (Specify: _____)

3. Are materials available for lending? _____ NO _____ YES

4. Is there a charge for the use of materials? _____ NO _____ YES

II. Pharmacy Operations and Activities

In this section, we would like to learn about various aspects of the management of your pharmacy and/or pharmacy corporation. The questions focus on selected aspects of general, personnel and financial management of your site. Please **CHECK (✓)** the line that best represents your answer for each question.

4. Does your pharmacy/pharmacy corporation have a vision statement?
   _____ NO
   _____ DON'T KNOW
   _____ YES → a. How familiar are you with its content?
   ____ Not familiar
   ____ Somewhat familiar
   ____ Very familiar

5. Does your pharmacy/pharmacy corporation have a mission statement?

_____ NO

_____ DON'T KNOW

_____ YES ➜ a. How familiar are you with its content?

____ Not familiar

____ Somewhat familiar

____ Very familiar

6. Does your pharmacy/pharmacy corporation have a formal plan for the future of the pharmacy?

_____ NO

_____ DON'T KNOW

_____ YES ➜ a. How far into the future does the plan look?

____ It is a 1 year plan

____ It is a 2 year plan

____ It is a 3 year plan

____ Other ➜ Specify:_____

b. What area(s) are covered in the plan? ➜ Please list: _____

_____

_____

c. About how frequently is the plan formally reviewed?

_____ The plan is not formally reviewed

_____ Quarterly

_____ Semi-annually

_____ Annually

_____ Every two years

_____ Every three or more years

_____ Other (Specify: _____)

7. When planning for the future of the pharmacy, is the pharmacy's past performance reviewed?

____ NO

____ DON'T KNOW

____ YES ➜ How far back is performance reviewed? _____ year(s), _____ months

Next, we want to learn more about personnel management in your pharmacy.

8. What period of time generally is covered by the staffing schedule for your pharmacy?
   _____ Less than 1 week
   _____ 1 week
   _____ 2 weeks
   _____ 3 weeks
   _____ 4 weeks
   _____ Other ➞ Specify: _____

9. How far in advance of its beginning date is the schedule for the pharmacy posted?
   _____ Less than 1 week
   _____ 1 to 2 weeks
   _____ 3 to 4 weeks
   _____ 1 to 2 months
   _____ More than 2 months
   _____ Other ➞ Specify: _____

10. How do you view the adequacy of resources in your pharmacy for each of the following areas?
    (Please **CHECK [✓]** the appropriate box):

	Very Inadequate	Somewhat Inadequate	Generally Adequate	More Than Adequate
a. Staffing levels				
b. Qualifications of staff (i.e., level of training)				
c. Payroll - wages				
d. Drug Inventory				

11. Do you have plans to hire any additional staff in the future?
    _____ NO
    _____ DON'T KNOW
    _____ YES ➞ a. When do you plan on hiring additional staff?
    _____ Don't know
    _____ Within the next 1 month
    _____ Within the next 2 months
    _____ Within the next 6 months
    _____ Within the next year
    _____ Other ➞ Specify: _____

    b. What type(s) and how many additional staff do you plan on hiring?
    (Check **ALL** that apply)
    _____ Pharmacist(s); Number _____
    _____ Technician(s); Number _____
    _____ Clerks(s); Number _____
    _____ Other ➞ Specify: _____; Number _____

c. Do you have a plan in place to deal with potential staff turnover?

_____ NO

_____ YES, I have started thinking about what to do

_____ YES, I have made a decision about what to do

_____ YES, I have a plan to deal with potential staff turnover

_____ Other ➞ Specify: _____

12. How are pharmacists trained at your pharmacy?

_____ Nothing specific; just jump right in and learn on the job ➞ Skip to Question 15

_____ Informal training only ➞ Skip to Question 15

_____ Formal orientation program (but no real training)

_____ Formal training program

_____ Both formal and informal training programs operate

13. What is the length of the formal training period?

_____ Less than 1 week

_____ 1 week

_____ 2 weeks

_____ 3 weeks

_____ 4 weeks

_____ Other ➞ Specify: _____

14. Who is responsible for training new pharmacists? _____

15. How are pharmacy technicians trained at your pharmacy?

_____ Nothing specific; just jump right in and learn on the job ➞ Skip to Question 18

_____ Informal training only ➞ Skip to Question 18

_____ Formal orientation program (but no real training)

_____ Formal training program

_____ Both formal and in formal training programs operate

16. What is the length of the formal training period?

_____ Less than 1 week

_____ 1 week

_____ 2 weeks

_____ 3 weeks

_____ 4 weeks

_____ Other ➞ Specify: _____

17. Who is responsible for training new pharmacy technicians? _____

18. Does your pharmacy utilize a formal performance review process to evaluate staff members?
    _____ NO, formal reviews are not done at this pharmacy
    _____ DON'T KNOW
    _____ YES → a. How often are reviews conducted? Please describe: _____
    _____

    b. Who is involved in the performance review process? (Check **ALL** that apply)
    _____ Pharmacy Manager
    _____ Employee himself/herself
    _____ Other pharmacy staff
    _____ Customers/patients
    _____ Other → Specify: _____

19. Does your organization reimburse expenses for staff to acquire new skills and competencies such as BPS certification, technician certification, specific disease management training?

    _____ My pharmacy does <u>not</u> reimburse expenses for additional training.
    _____ I don't know if pharmacy reimburses expenses.
    _____ My pharmacy reimburses expenses for (Check **ALL** that apply):
    _____ BPS certification
    _____ Disease management training (CDE, CAE, etc.)
    _____ Foreign language
    _____ Immunization certification
    _____ MBA
    _____ Post BS PharmD
    _____ Technician certification
    _____ Other →Specify:_____

20. Does your pharmacy offer a formal disease management program? (Check **ALL** that apply)
    _____ My pharmacy does not offer a formal disease management program → <u>Skip to Question 22</u>.
    _____ Asthma
    _____ Diabetes
    _____ Hypercholesterolemia
    _____ Hypertension
    _____ Smoking Cessation
    _____ Weight Loss
    _____ Other → Specify: _____

21. Who in your pharmacy is involved in providing these services? (Check **ALL** that apply.)
    _____ I am involved.
    _____ Another pharmacist is involved.
    _____ Several (but not all) pharmacists are involved.
    _____ All pharmacists are involved.
    _____ Other personnel → Specify: _____

Next, we'd like to learn about some of the financial activities of your pharmacy.

22. Community pharmacy practice is affected by seasonal changes for some categories of pharmaceutical products (i.e. cough and cold, allergy). What information do you use to plan for seasonal inventory cycles? (Check ALL that apply).

_____ We do not plan in advance for seasonal changes.
_____ Don't know
_____ Last years inventory levels
_____ CDC reports on cold and flu
_____ Pollen reports
_____ Local public health information
_____ Other (Specify: _____)

23. What does your pharmacy target for the number of inventory turns for the prescription department per year?

_____ No target in particular
_____ I am not sure whether there is a target
_____ Specific number of inventory turns (number: _____)

24. How frequently do you systematically review the following financial aspects of your pharmacy? For each, circle the frequency with which you review that activity.

a. Prescription volume.	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
b. Payroll.	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
c. Third-Parties as % of all payment .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
d. Net Profit	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
e. Gross Margin %. .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
f. Inventory dollars .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually

25. Does your pharmacy examine previous financial performance when evaluating the pharmacy's current financial performance?

_____ NO
_____ DON'T KNOW
_____ YES → How far back are previous comparisons made? _____ years _____ months

In the next series of questions, we want to learn about technology in your pharmacy.

26. Which of the following patient monitoring technologies does your pharmacy currently have and/or plan to upgrade or install in the future. Please **CHECK (✔)** all that apply. Specify the date that the pharmacy plans to upgrade or install any of these patient monitoring technologies.

Patient monitoring technologies	**Currently Have**	**Plan to Upgrade or Install**	**Approximate Date (YEAR)**
a. Asthma monitoring equipment (e.g., Airwatch Asthma Monitoring System)			
b. Blood pressure monitoring equipment (e.g., Dyanapulse)			
c. Cholesterol monitoring equipment (e.g., Cholestech)			
d. Diabetes monitoring equipment (e.g., In Charge Diabetes Control System)			
e. Computer software to bill for professional services			
f. Computer software to track patient health care outcomes			
g. Computer software to communicate with prescribers and/or clinics			
h. Electronic access to patient's clinic/medical records			
i. Other →Specify:_____ _____			

27. How frequently does your pharmacy upgrade your drug information database?

_____ Don't know/not sure
_____ Monthly
_____ Bimonthly
_____ Quarterly
_____ Semi-annually
_____ Yearly
_____ Other → Specify: _____

28. Does your pharmacy have a quality assessment/improvement program?

_____ NO
_____ DON'T KNOW
_____ YES, an informal program
_____ YES, a formal program

III. Time Perspective

Now, a somewhat different kind of topic. In this next section, we would like to learn more about how you think about a few aspects of time in relationship to your own experiences.

29. On the lines below, list six important experiences you expect to happen in <u>your own personal life</u> in the future.

    - These experiences may be pharmacy or non-pharmacy related.
    - You only need to jot down one or two words for each event for your ease of identification.
    - You may list your experiences in any order you wish.

    <u>After you have listed the six experiences</u>, please select the <u>time period</u> (below) that best represents when you think each event will occur. Indicate this by writing the number on the line following the experience.

Present	Very Near Future	Near Future	Distant Future	Very Distant Future
1	2	3	4	5

EXPERIENCE	TIME PERIOD
1. _____	____
2. _____	____
3. _____	____
4. _____	____
5. _____	____
6. _____	____

30. To get a better understanding of what the terms present, very near future, near future, distant future and very distant future mean to you, please complete the following sentences. In the following sentences, please fill in the blank spaces with <u>one of the words</u> or <u>the number of the word</u> listed below.

Seconds	Minutes	Hours	Days	Weeks	Months	Years
1	2	3	4	5	6	7

1. The *present*, as I think of it, extends from _____ ago to _____ from now.
2. As I think of it, the *very near future* includes things and event which will occur _____ from now, while the *near future* includes things and events which will occur _____ from now.
3. As I think of it, the *distant future* includes things and events which will occur _____ from now, while the *very distant future* includes things and events which will occur _____ from now.

IV. Background Information

Finally, we would like to learn a little bit about your background.

31. What education you have completed (Check **ALL** that apply).
    - _____ BS/BA not in pharmacy
    - _____ BS Pharmacy
    - _____ PharmD
    - _____ Residency(ies)➞ Specify area(s): _____
    - _____ Fellowship(s)➞ Specify area(s): _____
    - _____ Master's Degree ➞ Specify area(s): _____
    - _____ Doctoral Degree (PhD) ➞ Specify area(s): _____
    - _____ Other ➞ Specify area(s): _____

32. What certification programs have you completed (Check **ALL** that apply)?
    - _____ I have not completed any certification programs.
    - _____ BPS Certification ➞ Specify area(s): _____
    - _____ Other Certification ➞ Specify type(s): _____
    - _____ Other Certification ➞ Specify type(s): _____

33. What year were you born? _____

34. What is your gender?
    - _____ Female
    - _____ Male

35. In what year did you first obtain your license to practice pharmacy?
    ____ (year)

36. How long have you been working at this site? _____ years _____ months

37. What percentage of your time at work is spent in prescription processing/dispensing activities?
    (0 - 100%) _____%

THANK YOU VERY MUCH FOR YOUR ASSISTANCE!

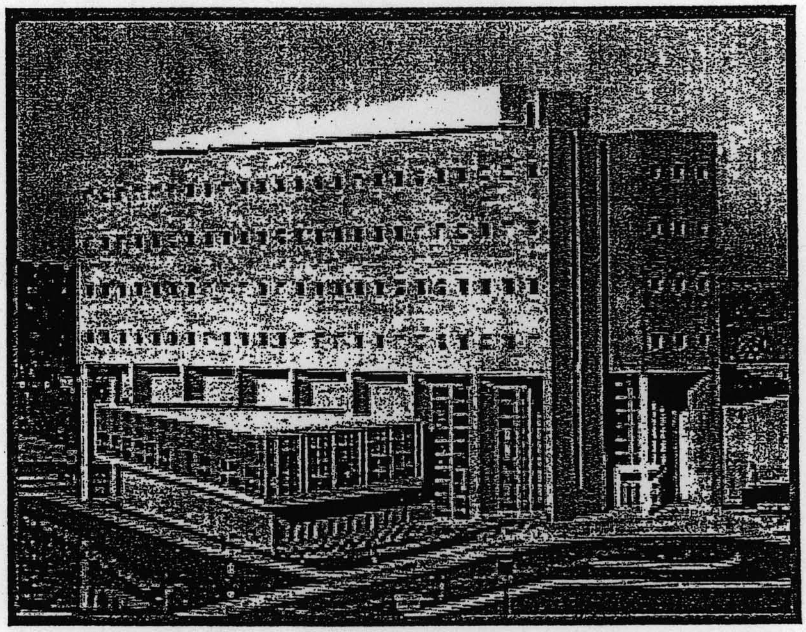
IF YOU HAVE ANY COMMENTS OR QUESTIONS ABOUT THIS STUDY,
PLEASE INCLUDE THEM IN THE SPACE BELOW OR INCLUDE
A SEPARATE SHEET OF PAPER

Please return the questionnaire in the self-addressed stamped envelope or return to:

Mary K. Gurney, RPh, MS
School of Pharmacy
University of Wisconsin
777 Highland Avenue
Madison, WI 53705

APPENDIX D: STAFF PHARMACIST SURVEY

A STUDY OF COMMUNITY PHARMACY PRACTICE SITES: Patient Care and Management Activities



Rennebohm Hall

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i. Deciding (with my patient) which alternative therapy is best	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
j. Informing my patient about his/her medications, their use, side effects, etc.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80

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k. Assessing my patient's understanding on every new medication they receive	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
l. Assessing my patient's experience with their medications with every first refill	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
m. Designing a therapeutic drug-monitoring plan that looks at adverse effects	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
n. Evaluating whether desired outcomes are being achieved.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
o. Intervening to adjust my patient's medication regimen.	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
p. Follow-up on therapy and outcomes on a long-term basis	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
q. Documenting counseling, interventions and observations ...	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
r. Encouraging the use of compliance aids to my patients with complex problems (medication regimens) .	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
s. Performing disease management for certain groups of patients with the same disease or problem	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80
t. Performing special services (e.g., blood pressure checks, glucose monitoring etc.)	-2	-1	0	+1	+2	+3	+4	≤5	5-20	20-40	40-60	60-80	≥80

Next we would like to learn about your pharmacy practice site.

2. How would you describe your site in terms of its: (Place **CHECK** [✔] on line)

a. Orientation: Patient ——— Product

b. Focus: Quality ——— Quantity

c. Pharmacist's work: Professional ——— Technical

3. Does your pharmacy:

a. provide immunizations (e.g., influenza, pneumococcal, etc)? ____NO ____ YES

b. bill for cognitive services (e.g., extended counseling, problem solving)? ____NO ____ YES

c. have a patient education center/area? ____ NO _____ YES

1. If YES, How large is the area (i.e. square feet or shelf space) _____

2. What types of materials are available for use? (Check **ALL** that apply)
   _____ Books
   _____ Videos
   _____ Pamphlets
   _____ Computer with internet access
   _____ Other (Specify: _____)

3. Are materials available for lending? _____ NO _____ YES

4. Is there a charge for the use of materials? _____ NO _____ YES

II. Pharmacy Operations and Activities

In this section, we would like to learn about various aspects of the management of your pharmacy and/or pharmacy corporation. The questions focus on selected aspects of general, personnel and financial management of your site. Please **CHECK (✓)** the line that best represents your answer for each question.

4. Does your pharmacy/pharmacy corporation have a vision statement?
   _____ NO
   _____ DON'T KNOW
   _____ YES → a. How familiar are you with its content?
   ____ Not familiar
   ____ Somewhat familiar
   ____ Very familiar

5. Does your pharmacy/pharmacy corporation have a mission statement?

_____ NO

_____ DON'T KNOW

_____ YES ➜ a. How familiar are you with its content?

____ Not familiar

____ Somewhat familiar

____ Very familiar

6. Does your pharmacy/pharmacy corporation have a formal plan for the future of the pharmacy?

_____ NO

_____ DON'T KNOW

_____ YES ➜ a. How far into the future does the plan look?

____ It is a 1 year plan

____ It is a 2 year plan

____ It is a 3 year plan

____ Other ➜ Specify:_____

b. What area(s) are covered in the plan? ➜ Please list: _____

_____

_____

c. About how frequently is the plan formally reviewed?

_____ The plan is not formally reviewed

_____ Quarterly

_____ Semi-annually

_____ Annually

_____ Every two years

_____ Every three or more years

_____ Other (Specify: _____)

7. When planning for the future of the pharmacy, is the pharmacy's past performance reviewed?

____ NO

____ DON'T KNOW

____ YES ➜ How far back is performance reviewed? _____ year(s), _____ months

Next, we want to learn more about personnel management in your pharmacy.

8. What period of time generally is covered by the staffing schedule for your pharmacy?
   _____ less than 1 week
   _____ 1 week
   _____ 2 weeks
   _____ 3 weeks
   _____ 4 weeks
   _____ Other ➞ Specify: _____

9. How far in advance of its beginning date is the schedule for the pharmacy posted?
   _____ Less than 1 week
   _____ 1 to 2 weeks
   _____ 3 to 4 weeks
   _____ 1 to 2 months
   _____ More than 2 months
   _____ Other ➞ Specify: _____

10. How do you view the adequacy of resources in your pharmacy for each of the following areas? (Please CHECK (✓) the appropriate box):

	Very Inadequate	Somewhat Inadequate	Generally Adequate	More Than Adequate
a. Staffing levels				
b. Qualifications of staff (i.e., level of training)				
c. Payroll - wages				
d. Drug Inventory				

11. Do you know if your pharmacy has any plans to hire any additional staff in the future?
   _____ NO
   _____ DON'T KNOW
   _____ YES ➞ a. Do you know how soon your pharmacy plans on hiring additional staff?
      _____ Don't know
      _____ Within the next 1 month
      _____ Within the next 2 months
      _____ Within the next 6 months
      _____ Within the next year
      _____ Other ➞ Specify: _____

   b. Do you know what type(s) of staff? (Check ALL that apply)
      _____ Don't know
      _____ Pharmacist(s)
      _____ Technician(s)
      _____ Clerks(s)
      _____ Other ➞ Specify: _____

12. How are pharmacists trained at your pharmacy?

_____ Nothing specific; just jump right in and learn on the job → Skip to Question 15
_____ Informal training only → Skip to Question 15
_____ Formal orientation program (but no real training)
_____ Formal training program
_____ Both formal and informal training programs operate

13. What is the length of the formal training period?

_____ Less than 1 week
_____ 1 week
_____ 2 weeks
_____ 3 weeks
_____ 4 weeks
_____ Other → Specify: _____

14. Who is responsible for training new pharmacists? _____

15. How are pharmacy technicians trained at your pharmacy?

_____ Nothing specific; just jump right in and learn on the job → Skip to Question 18
_____ Informal training only → Skip to Question 18
_____ Formal orientation program (but no real training)
_____ Formal training program
_____ Both formal and in formal training programs operate

16. What is the length of the formal training period?

_____ Less than 1 week
_____ 1 week
_____ 2 weeks
_____ 3 weeks
_____ 4 weeks
_____ Other → Specify: _____

17. Who is responsible for training new pharmacy technicians? _____

18. Does your pharmacy utilize a formal performance review process to evaluate staff members?

_____ NO, formal reviews are not done at this pharmacy
_____ DON'T KNOW
_____ YES → a. How often are reviews conducted? Please describe: _____
_____

b. Who is involved in the performance review process? (Check ALL that apply)

_____ Pharmacy Manager
_____ Employee himself/herself
_____ Other pharmacy staff
_____ Customers/patients
_____ Other → Specify: _____

19. Does your organization reimburse expenses for staff to acquire new skills and competencies such as BPS certification, technician certification, specific disease management training?

_____ My pharmacy does not reimburse expenses for additional training.
_____ I don't know if pharmacy reimburses expenses.
_____ My pharmacy reimburses expenses for (Check ALL that apply):
- _____ BPS certification
- _____ Disease management training (CDE, CAE, etc.)
- _____ Foreign language
- _____ Immunization certification
- _____ MBA
- _____ Post BS PharmD
- _____ Technician certification
- _____ Other ➞Specify:_____

20. Does your pharmacy offer a formal disease management program? (Check ALL that apply)

_____ My pharmacy does not offer a formal disease management program ➞ Skip to Question 22.
_____ Asthma
_____ Diabetes
_____ Hypercholesterolemia
_____ Hypertension
_____ Smoking Cessation
_____ Weight Loss
_____ Other ➞ Specify: _____

21. Who in your pharmacy is involved in providing these services? (Check ALL that apply.)

_____ I am involved.
_____ Another pharmacist is involved.
_____ Several (but not all) pharmacists are involved.
_____ All pharmacists are involved.
_____ Other personnel ➞ Specify: _____

Next, we'd like to learn about some of the financial activities of your pharmacy.

22. Community pharmacy practice is affected by seasonal changes for some categories of pharmaceutical products (i.e. cough and cold, allergy). What information do you use to plan for seasonal inventory cycles? (Check ALL that apply).

_____ We do not plan in advance for seasonal changes.
_____ Don't know
_____ Last years inventory levels
_____ CDC reports on cold and flu
_____ Pollen reports
_____ Local public health information
_____ Other (Specify: _____)

23. What does your pharmacy target for the number of inventory turns for the prescription department per year?

_____ No target in particular
_____ I am not sure whether there is a target
_____ Specific number of inventory turns (number: _____)

24. How frequently do you systematically review the following financial aspects of your pharmacy? For each, circle the frequency with which you review that activity.

a. Prescription volume.	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
b. Payroll.	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
c. Third-Parties as % of all payment .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
d. Net Profit	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
e. Gross Margin %. .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually
f. Inventory dollars .	Daily	Weekly	Monthly	Quarterly	Semi-Annually	Annually

25. Does your pharmacy examine previous financial performance when evaluating the pharmacy's current financial performance?

_____ NO
_____ DON'T KNOW
_____ YES → How far back are previous comparisons made? _____ years _____ months

In the next series of questions, we want to learn about technology in your pharmacy.

26. Which of the following patient monitoring technologies does your pharmacy currently have and/or plan to upgrade or install in the future. Please **CHECK** (✔) all that apply. Specify the date that the pharmacy plans to upgrade or install any of these patient monitoring technologies.

Patient monitoring technologies	**Currently Have**	**Plan to Upgrade or Install**	**Approximate Date (YEAR)**
a. Asthma monitoring equipment (e.g., Airwatch Asthma Monitoring System)			
b. Blood pressure monitoring equipment (e.g., Dyanapulse)			
c. Cholesterol monitoring equipment (e.g., Cholestech)			
d. Diabetes monitoring equipment (e.g., In Charge Diabetes Control System)			
e. Computer software to bill for professional services			
f. Computer software to track patient health care outcomes			
g. Computer software to communicate with prescribers and/or clinics			
h. Electronic access to patient's clinic/medical records			
i. Other ➞Specify:_____ _____			

27. How frequently does your pharmacy upgrade your drug information database?

_____ Don't know/not sure
_____ Monthly
_____ Bimonthly
_____ Quarterly
_____ Semi-annually
_____ Yearly
_____ Other ➞ Specify: _____

28. Does your pharmacy have a quality assessment/improvement program?

_____ NO
_____ DON'T KNOW
_____ YES, an informal program
_____ YES, a formal program

III. Time Perspective

Now, a somewhat different kind of topic. In this next section, we would like to learn more about how you think about a few aspects of time in relationship to your own experiences.

29. On the lines below, list six important experiences you expect to happen in <u>your own personal life</u> in the future.

    - These experiences may be pharmacy or non-pharmacy related.
    - You only need to jot down one or two words for each event for your ease of identification.
    - You may list your experiences in any order you wish.

    <u>After you have listed the six experiences</u>, please select the <u>time period</u> (below) that best represents when you think each event will occur. Indicate this by writing the number on the line following the experience.

Present	Very Near Future	Near Future	Distant Future	Very Distant Future
1	2	3	4	5

EXPERIENCE	TIME PERIOD
1. _____	____
2. _____	____
3. _____	____
4. _____	____
5. _____	____
6. _____	____

30. To get a better understanding of what the terms present, very near future, near future, distant future and very distant future mean to you, please complete the following sentences. In the following sentences, please fill in the blank spaces with <u>one of the words</u> or <u>the number of the word</u> listed below.

Seconds	Minutes	Hours	Days	Weeks	Months	Years
1	2	3	4	5	6	7

1. The *present*, as I think of it, extends from _____ ago to _____ from now.
2. As I think of it, the *very near future* includes things and event which will occur _____ from now, while the *near future* includes things and events which will occur _____ from now.
3. As I think of it, the *distant future* includes things and events which will occur _____ from now, while the *very distant future* includes things and events which will occur _____ from now.

IV. Background Information

Finally, we would like to learn a little bit about your background.

31. What education you have completed (Check ALL that apply).
    - _____ BS/BA not in pharmacy
    - _____ BS Pharmacy
    - _____ PharmD
    - _____ Residency(ies)→ Specify area(s): _____
    - _____ Fellowship(s)→ Specify area(s): _____
    - _____ Master's Degree → Specify area(s): _____
    - _____ Doctoral Degree (PhD) → Specify area(s):_____
    - _____ Other → Specify area(s):_____

32. What certification programs have you completed (Check ALL that apply)?
    - _____ I have not completed any certification programs.
    - _____ BPS Certification → Specify area(s): _____
    - _____ Other Certification → Specify type(s): _____
    - _____ Other Certification → Specify type(s): _____

33. What year were you born? _____

34. What is your gender?
    - _____ Female
    - _____ Male

35. In what year did you first obtain your license to practice pharmacy?
    - ____ ____ ____ ____ (year)
    - _____ I am not yet licensed as a pharmacist.

36. How long have you been working at this site? _____ years _____ months

37. What percentage of your time at work is spent in prescription processing/dispensing activities? (0 - 100%) _____%

38. What is your work schedule a this pharmacy site?
    - ____ Full time (≥ 30 hours)
    - ____ Part time → _____ regular schedule → Describe:_____
      _____ I work when needed

39. Do you have any administrative or management responsibilities?
    - ____ NO
    - ____ YES → Please describe:_____
      _____

THANK YOU VERY MUCH FOR YOUR ASSISTANCE!
IF YOU HAVE ANY COMMENTS OR QUESTIONS ABOUT THIS STUDY, PLEASE INCLUDE THEM ON A SEPARATE SHEET OF PAPER

Please return the questionnaire in the self-addressed stamped envelope or return to:

Mary K. Gurney, RPh, MS
School of Pharmacy
University of Wisconsin- Madison
777 Highland Avenue
Madison, WI 53705

APPENDIX E: DATA COLLECTION PROCESS

Table E-1: Data Collection Process

	Data Collection Waves		
Data Collection Process	**Wave 1**	**Wave 2**	**Wave 3**
Initial Contact with Pharmacy Managers	May 15 - 22	June 5 – August 20	August 5 - 20
Number of Sites Contacted	12	32	30
Interviews Completed	May 29 – June 16	June 14 – September 17	August 13 – September 17
Number of Interviews	11	23	16
Initial Surveys Sent	July 2	July 22 and 29, September 23	September 15 and 23
Number of Surveys	38	90	72
Reminder Letters	July 15	August 5 and 12	September 30
Number of Letters	31	43	46
Second Surveys Sent	July 29	August 19 and 26	October 14 and 23
Number of Second Surveys	21	22	32
Surveys Received (as of November 11, 2002)	22	70	40
Thank You Notes	July 10 – August 19	August 5 – October 28	September 30 – November 11
Pharmacies With No Surveys Returned	1	0	1

Figure E-1: Data Collection Process

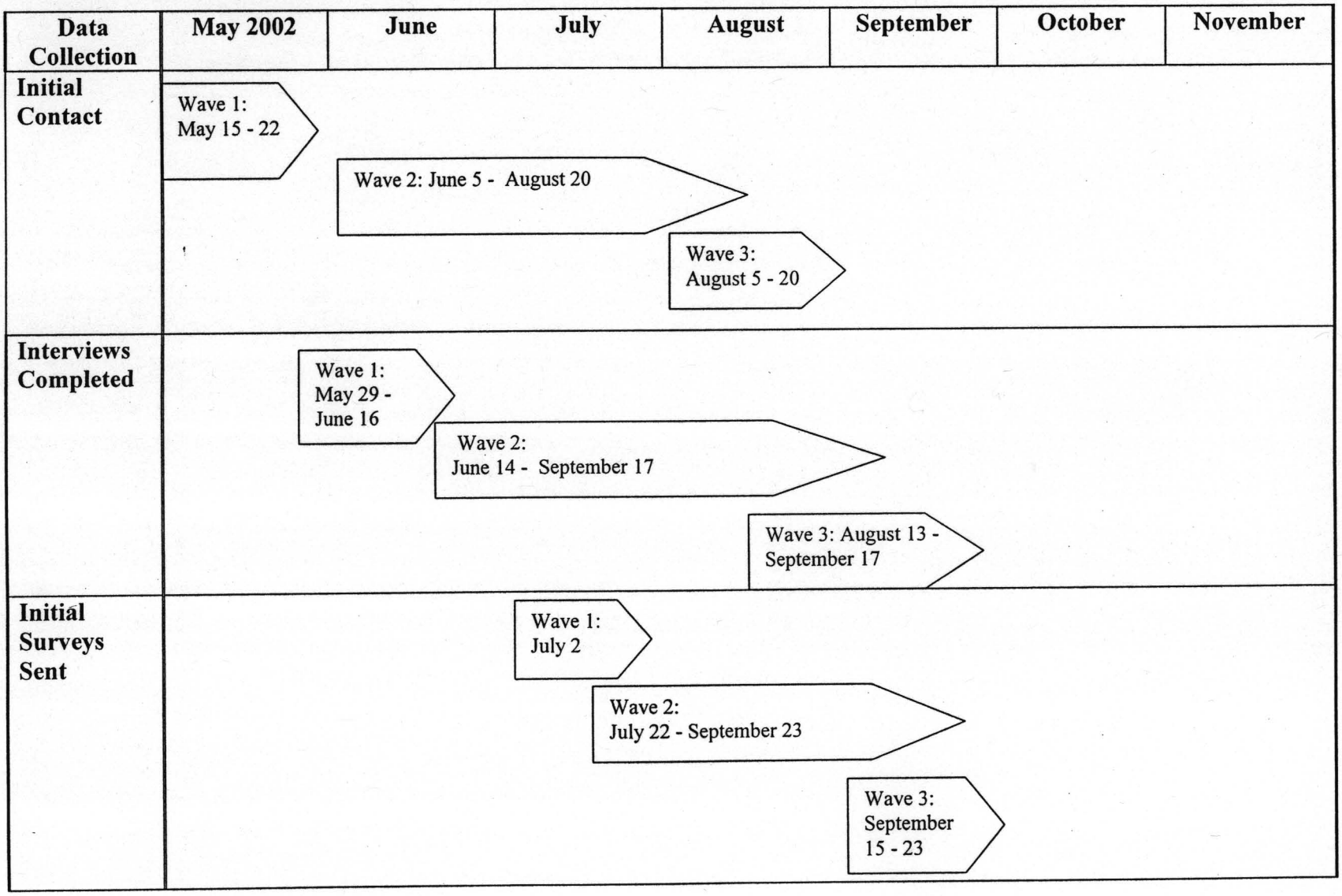
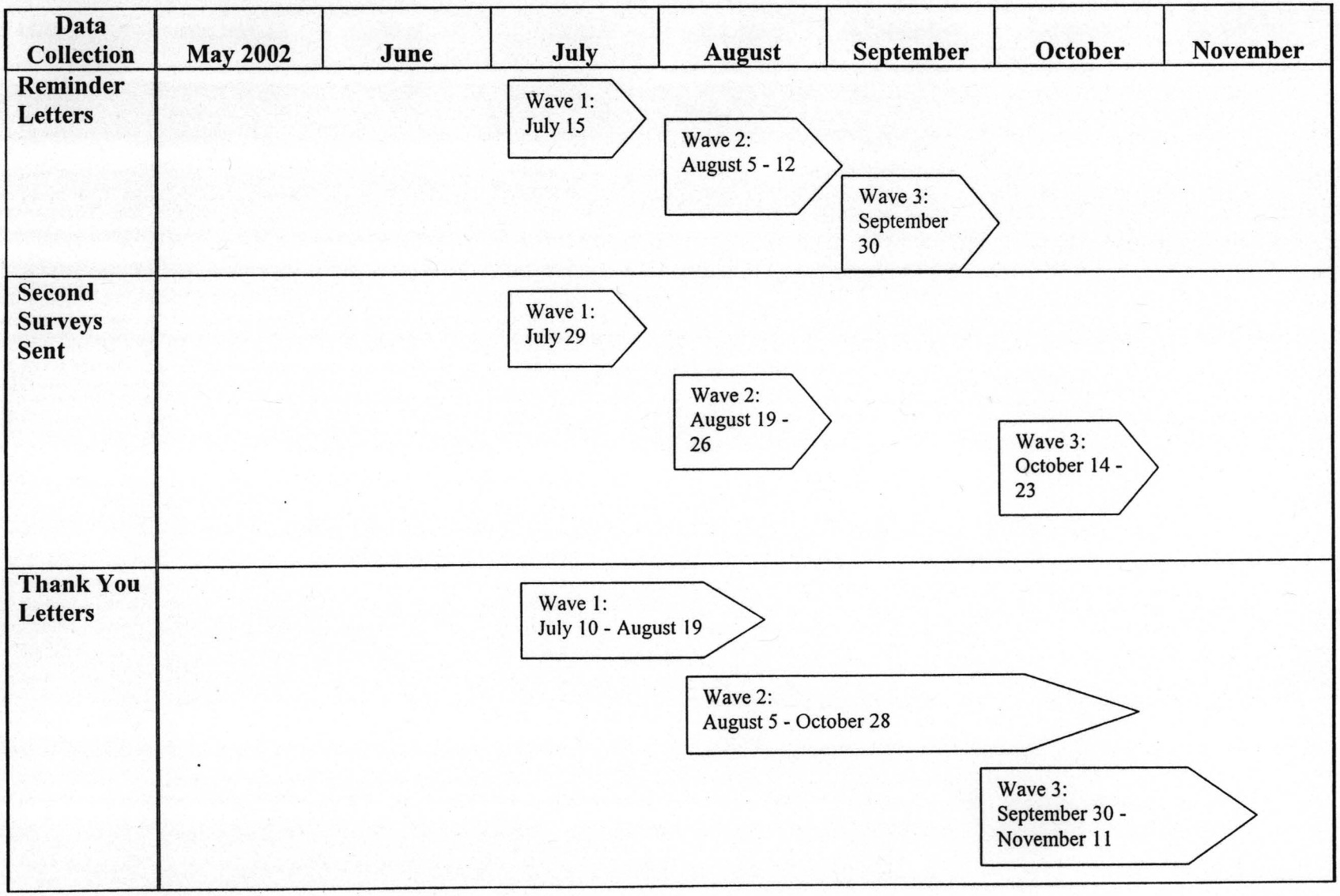


Figure E-1: Data Collection continued



APPENDIX F: FREQUENCY HISTOGRAMS FOR DESCRIPTIVE RESULTS

Figure F1: Frequency Histogram for Prescription Workload (WORKLOAD)

Count	Midpoint
1	4.3
3	5.6
4	7.9
8	9.9
7	12.3
8	13.9
3	16.5
3	17.5
0	20.0
0	22.0
1	23.5
1	25.0

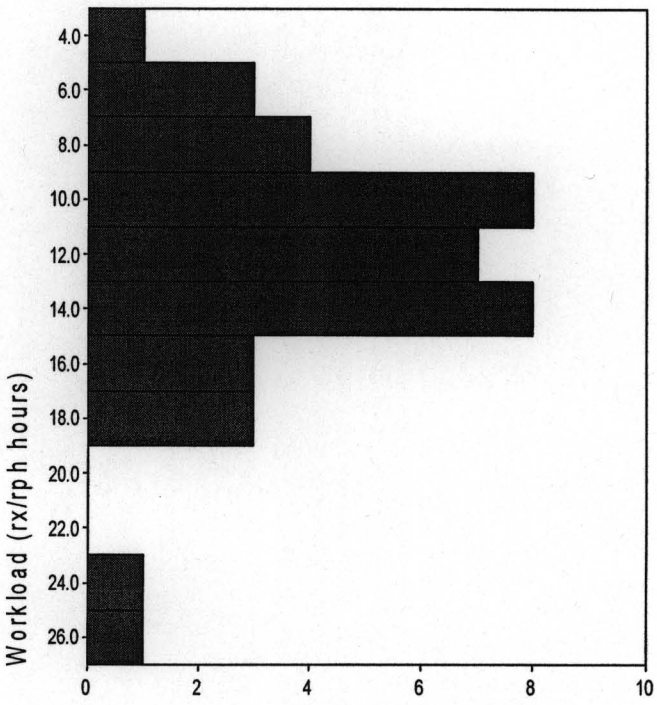


Figure F2: Frequency Histogram for Future Time Perspective (FTP)

Count	Midpoint
1	2.50
7	2.76
5	2.95
10	3.23
5	3.50
7	3.76
2	4.0
1	4.25
1	4.59

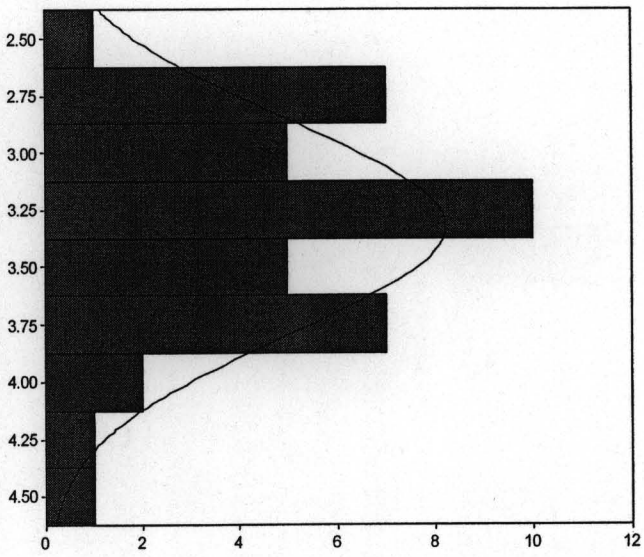


Figure F3: Frequency Histogram for Strategic Management Index (SMI)

Count	Midpoint
3	0.00
0	10.00
0	20.00
5	30.60
10	35.93
6	49.50
6	59.22
5	68.62
3	79.50
1	90.00

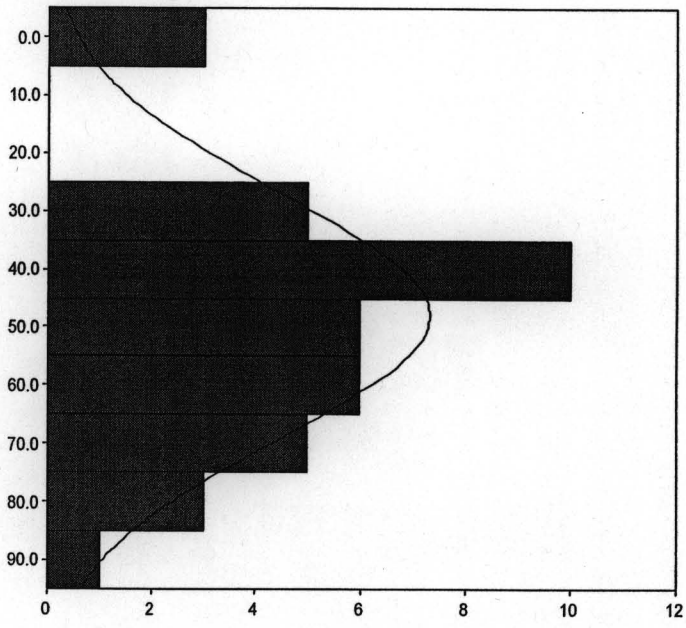


Figure F4: Frequency Histogram for Operational Management Index (OMI)

Count	Midpoint
1	63.59
1	71.50
0	80.00
2	91.00
3	101.89
4	112.13
3	120.44
2	129.25
5	137.94
3	147.00
3	160.09
5	168.71
4	177.33
3	191.33

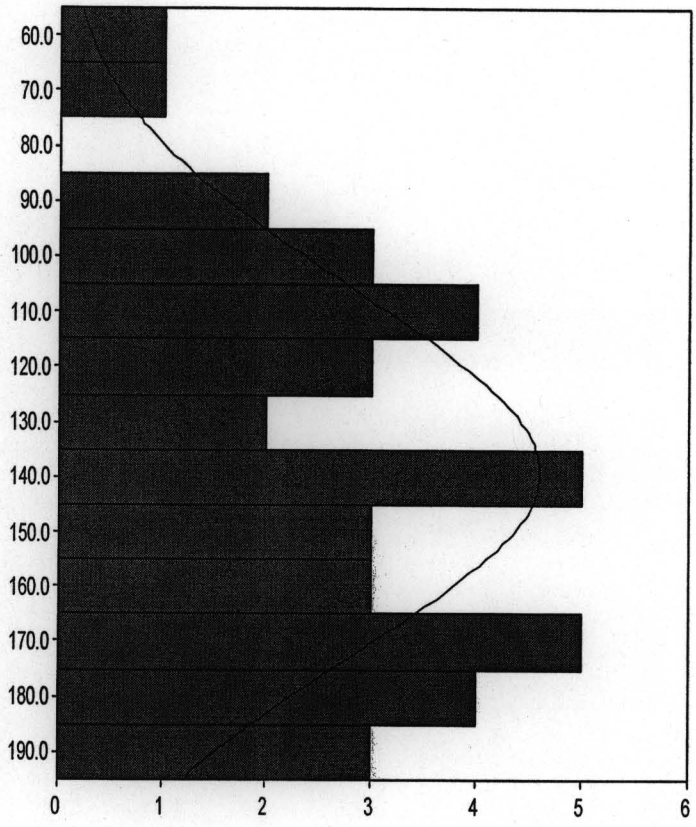
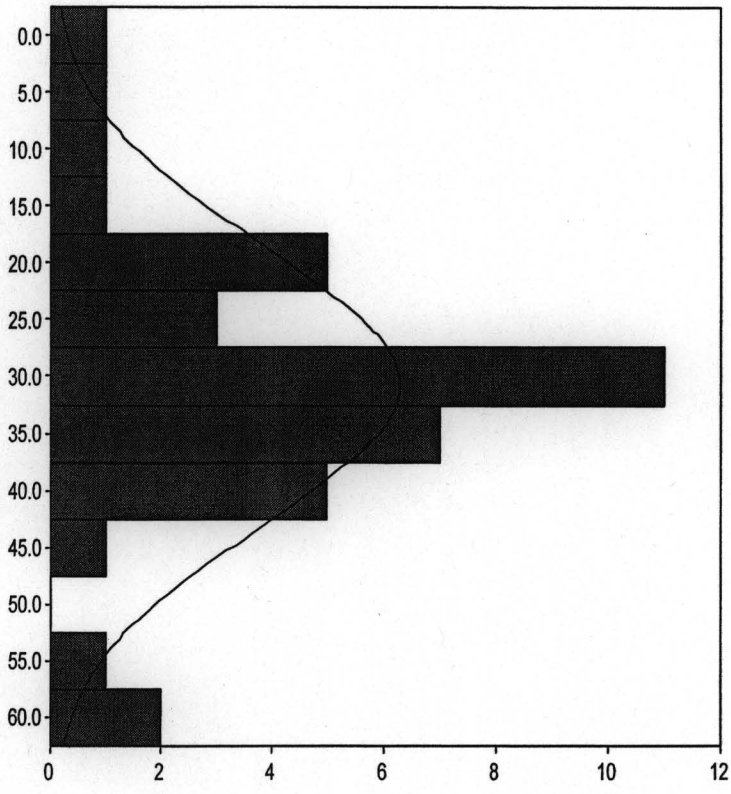


Figure F5: Frequency Histogram of Drug Therapy Management Index (DTM)

Count	Midpoint
1	2.00
1	4.47
1	10.19
1	16.29
5	20.35
3	25.67
11	29.84
7	35.16
5	38.75
1	46.33
0	50.00
1	52.50
2	60.60



APPENDIX G: BIVARIATE PLOTS OF VARIABLES

Figure G1: Bivariate Plot of Workload (WORKLOAD) and Drug Therapy Management (DTM)

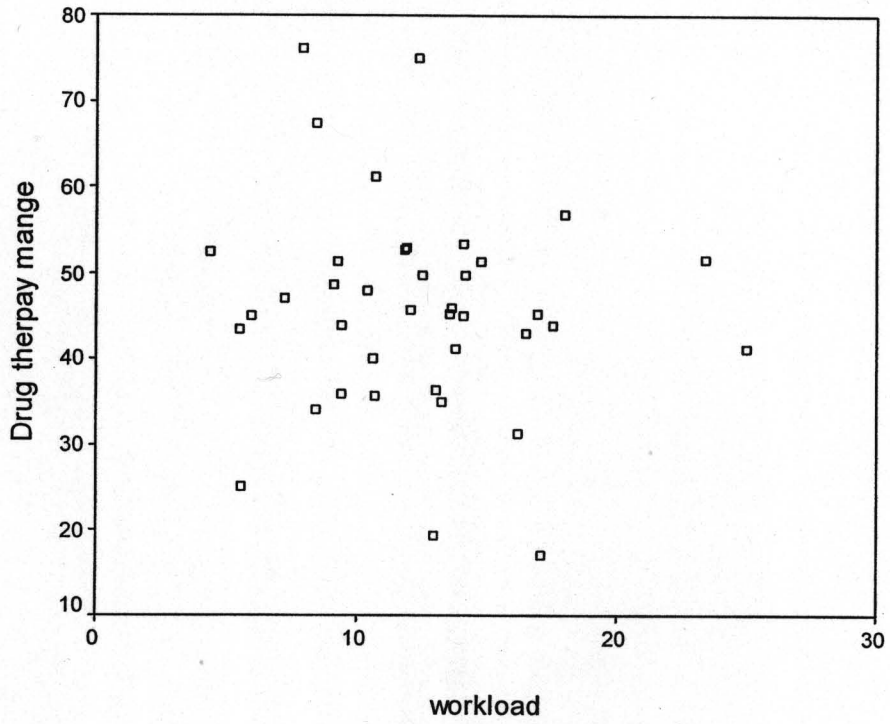


Figure G2: Bivariate Plot of Pharmacist Intensity (RPHINT) and Drug Therapy Management (DTM)

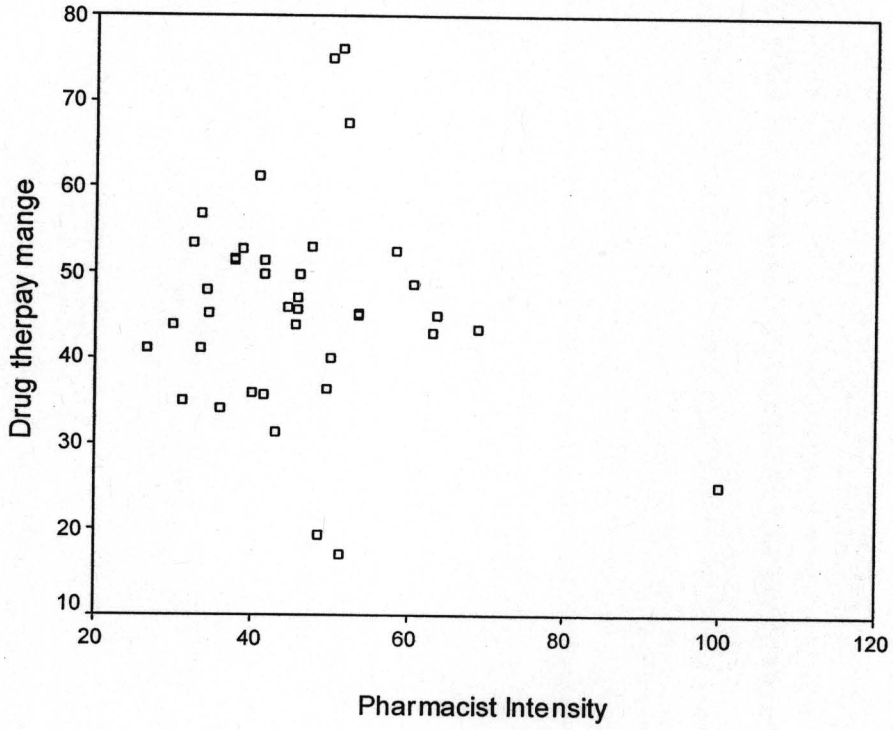


Figure G3: Bivariate Plot of Future Time Perspective (FTP) and Drug Therapy Management (DTM)

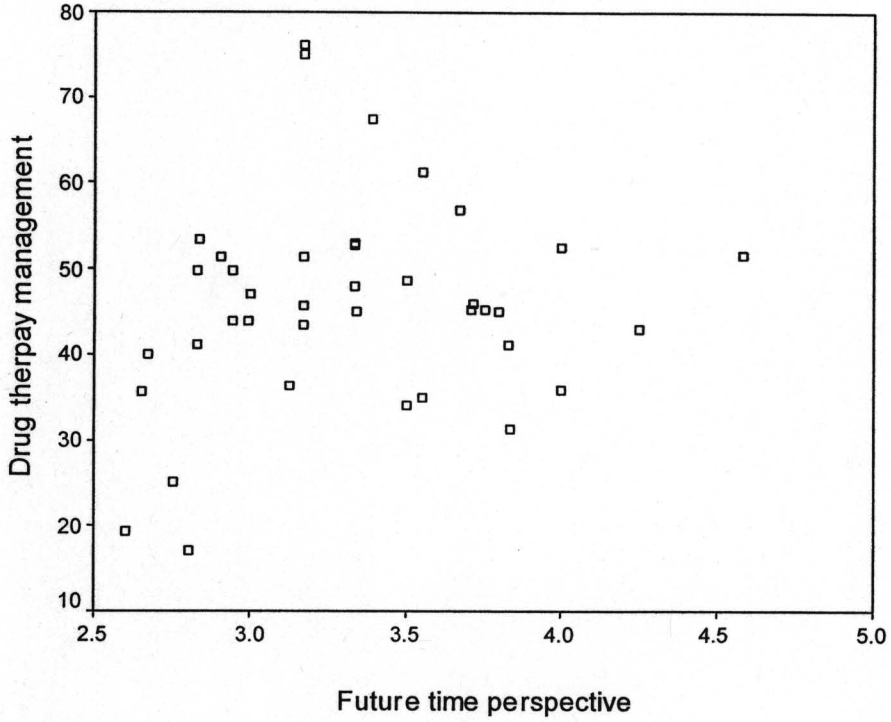


Figure G4: Bivariate Plot of Strategic Management Index (SMI) and Drug Therapy Management (DTM)

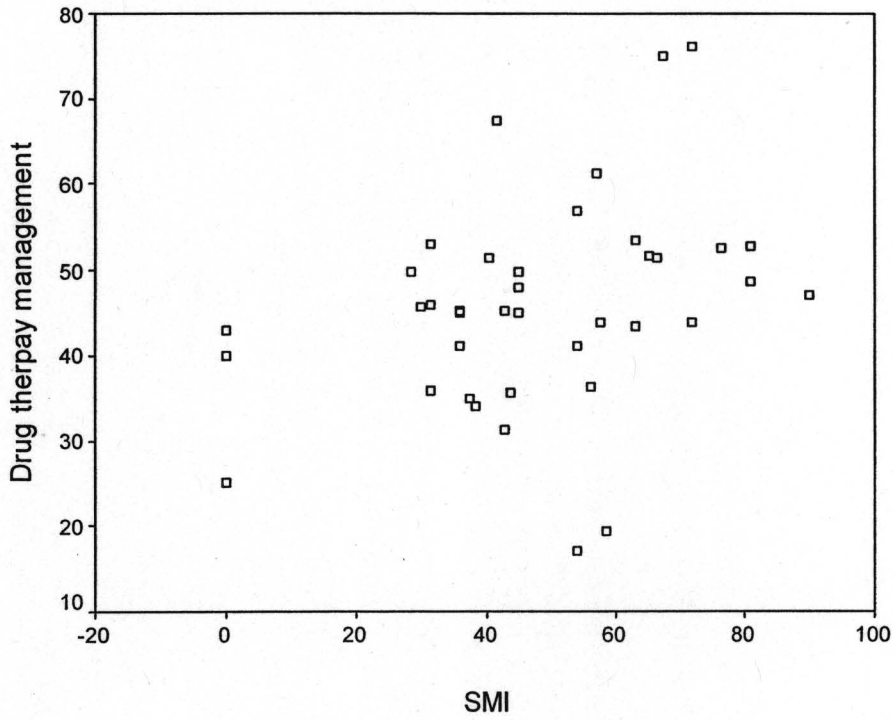


Figure G5: Bivariate Plot of Operational Management (OMI) and Drug Therapy Management (DTM)

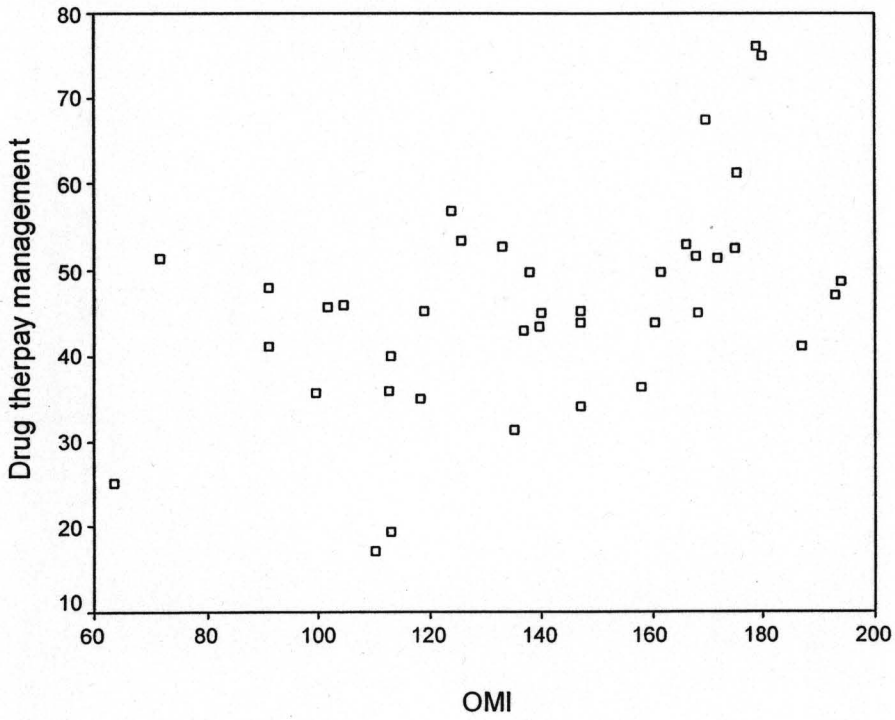


Figure G6: Bivariate Plot of Future Time Perspective (FTP) and Strategic Management Index (SMI)

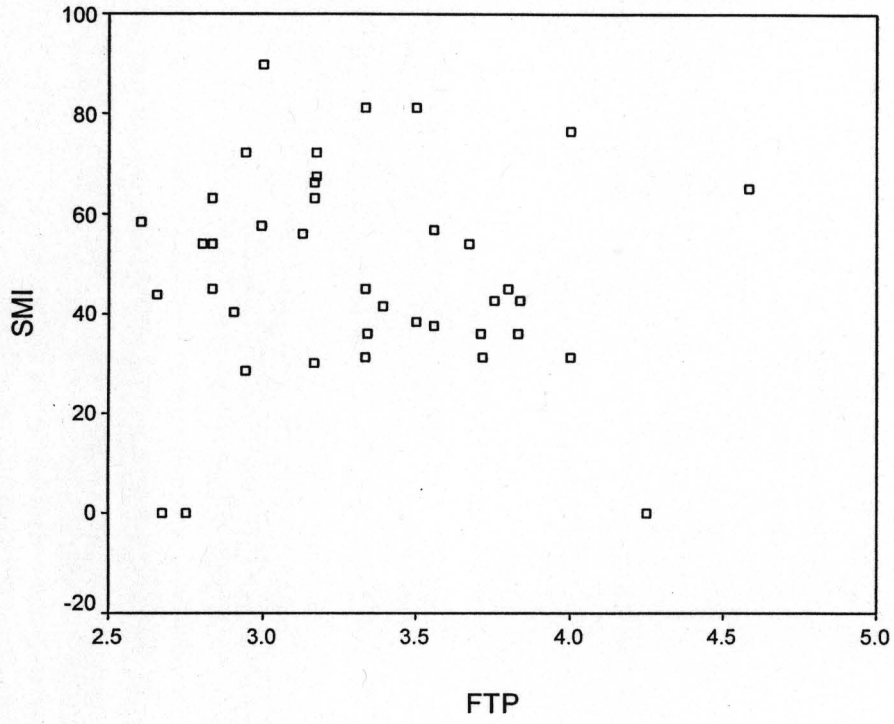
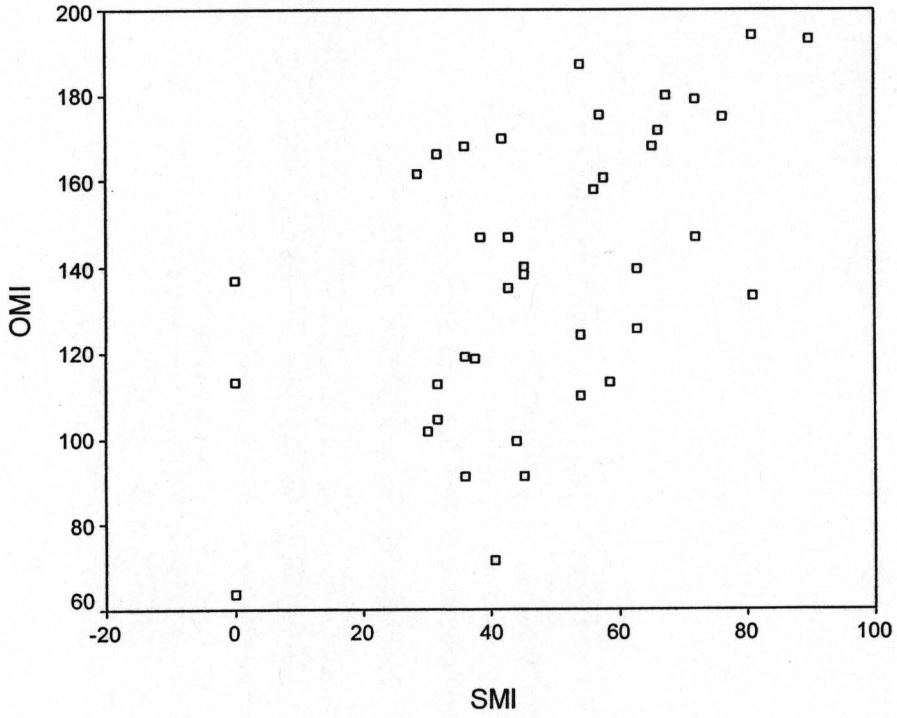


Figure G7: Bivariate Plot of Strategic Management Index (SMI) and Operational Management Index (OMI)



APPENDIX H: RESIDUAL ANALYSIS FOR ALL REGRESSION MODELS

Residuals: Fitted Model Predicting Strategic Management

Table H1: Residual Statistics: Fitted Model Predicting SMI

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	19.24	68.38	48.01	11.54	39
Residual	-37.45	27.55	0.00	17.80	39
Std. Predicted Value	-2.50	1.77	0.00	1.00	39
Std. Residual	-1.99	1.47	0.00	0.95	

Durbin – Watson Test = 2.43

Figure H1: Histogram of Standardized Residual Variables Regressed on SMI

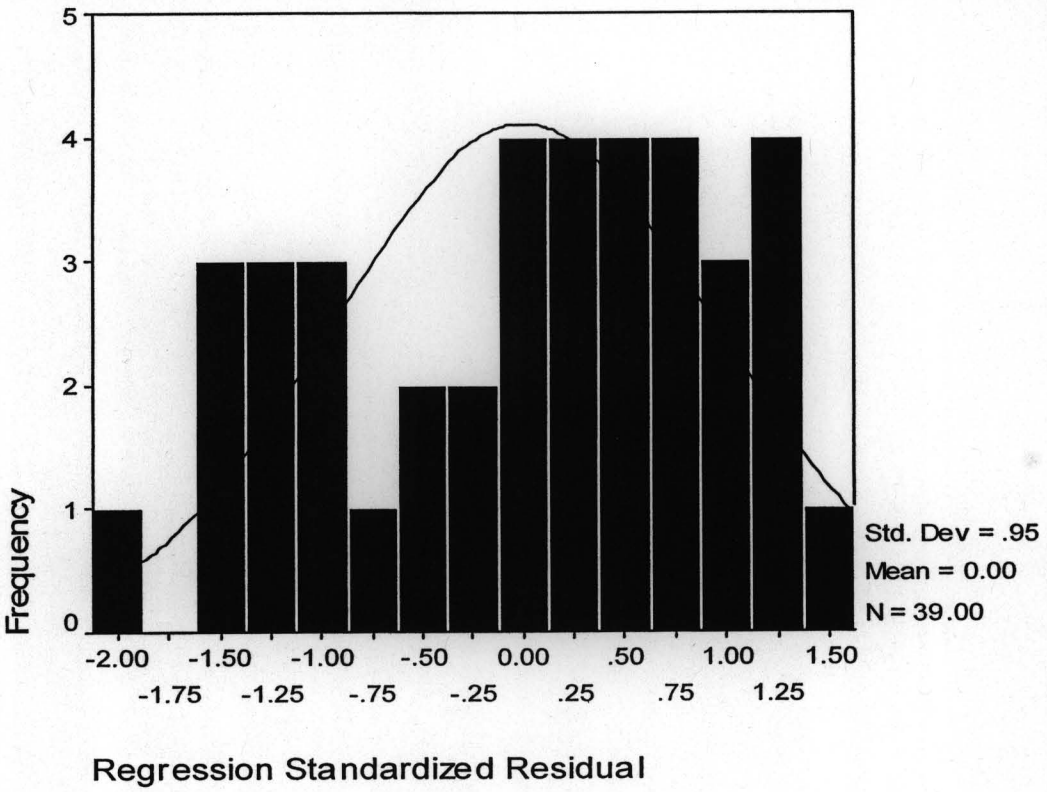
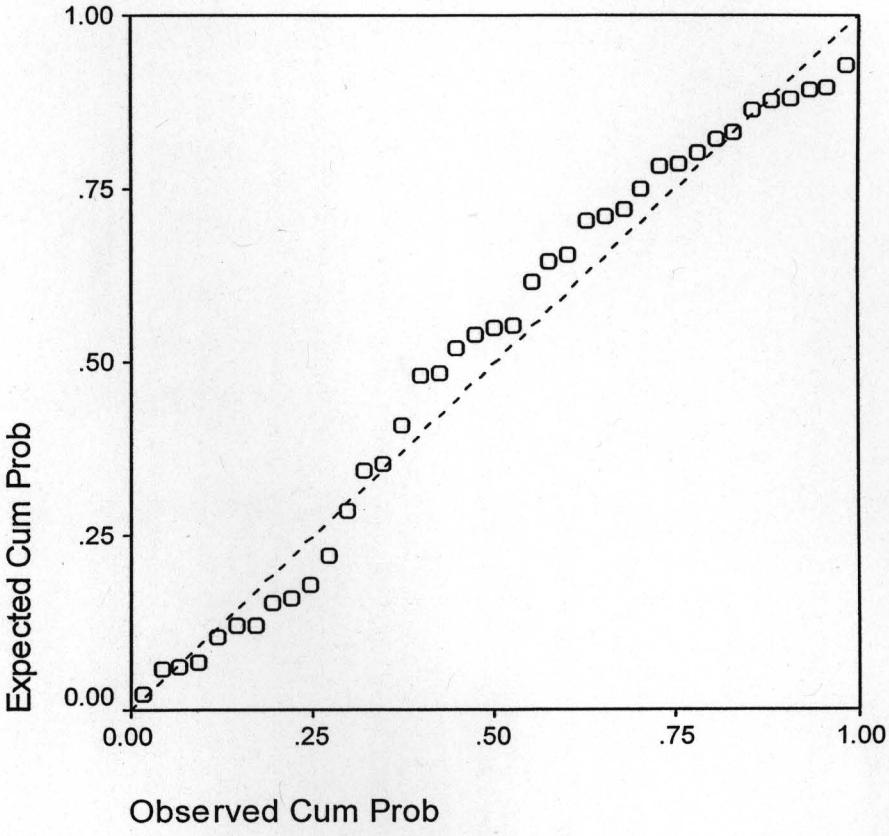


Figure H2: Normal Probability (P-P) Plot for Standardized Residual for Variables Regressed on SMI



Residuals: Fitted Model Predicting Operational Management

Table H2: Residual Statistics: Fitted Model Predicting OMI

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	99.93	182.98	139.20	20.07	39
Residual	-53.76	45.61	0.00	27.13	39
Std. Predicted Value	-1.96	2.18	0.00	1.00	39
Std. Residual	-1.85	1.57	0.00	0.93	39

Durbin – Watson Test = 2.233

Figure H3: Histogram of Standardized Residual for Variables Regressed on OMI

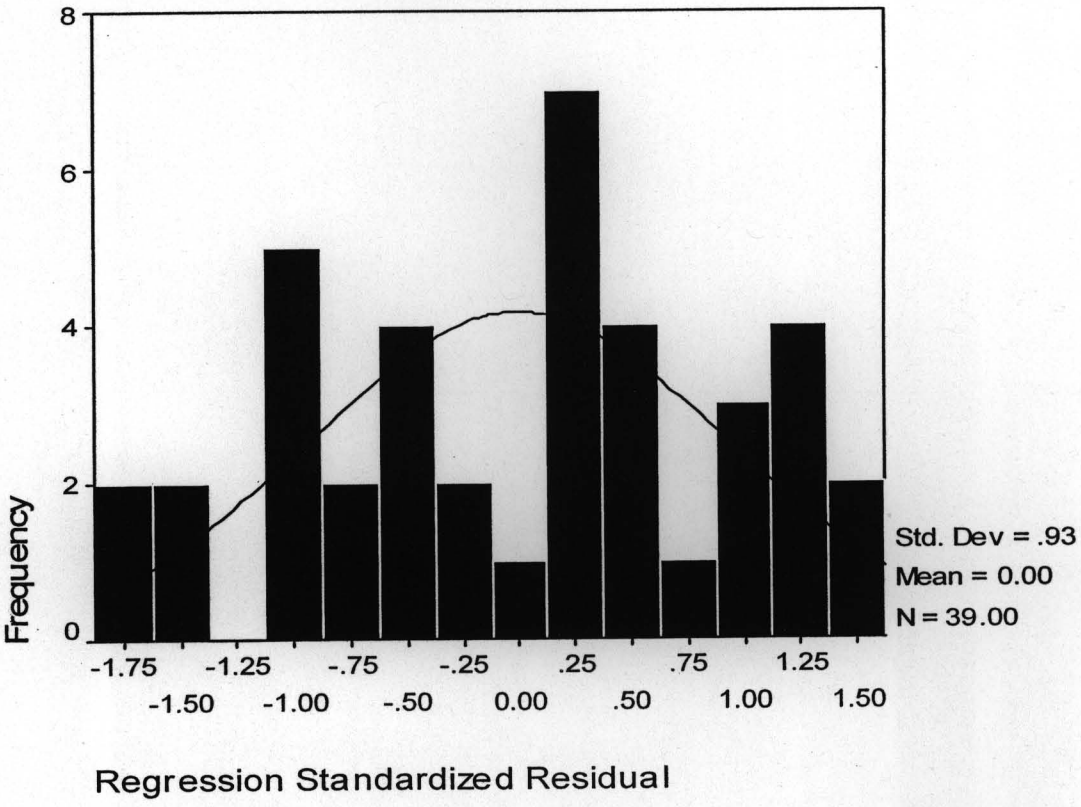
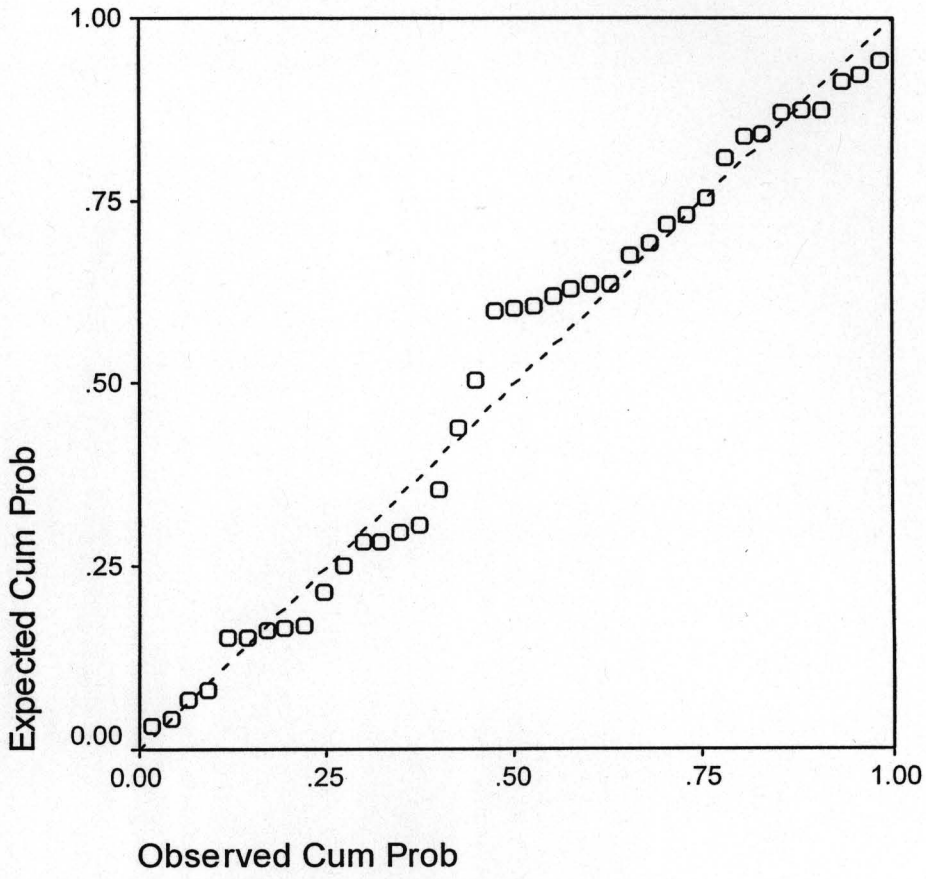


Figure H4: Normal Probability (P-P) Plot for Standardized Residual for Variables Regressed on OMI



Residuals: Fitted Model Predicting Drug Therapy Management

Table H3: Residual Statistics: Fitted Model Predicting DTMI

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	26.34	57.87	45.77	6.75	39
Residual	-19.42	24.97	0.00	10.32	39
Std. Predicted Value	-2.88	1.79	0.00	1.00	39
Std. Residual	-1.75	2.26	0.00	0.93	39

Durbin – Watson Test = 2.336

Figure H5: Histogram of Standardized Residual for Variables Regressed on DTMI

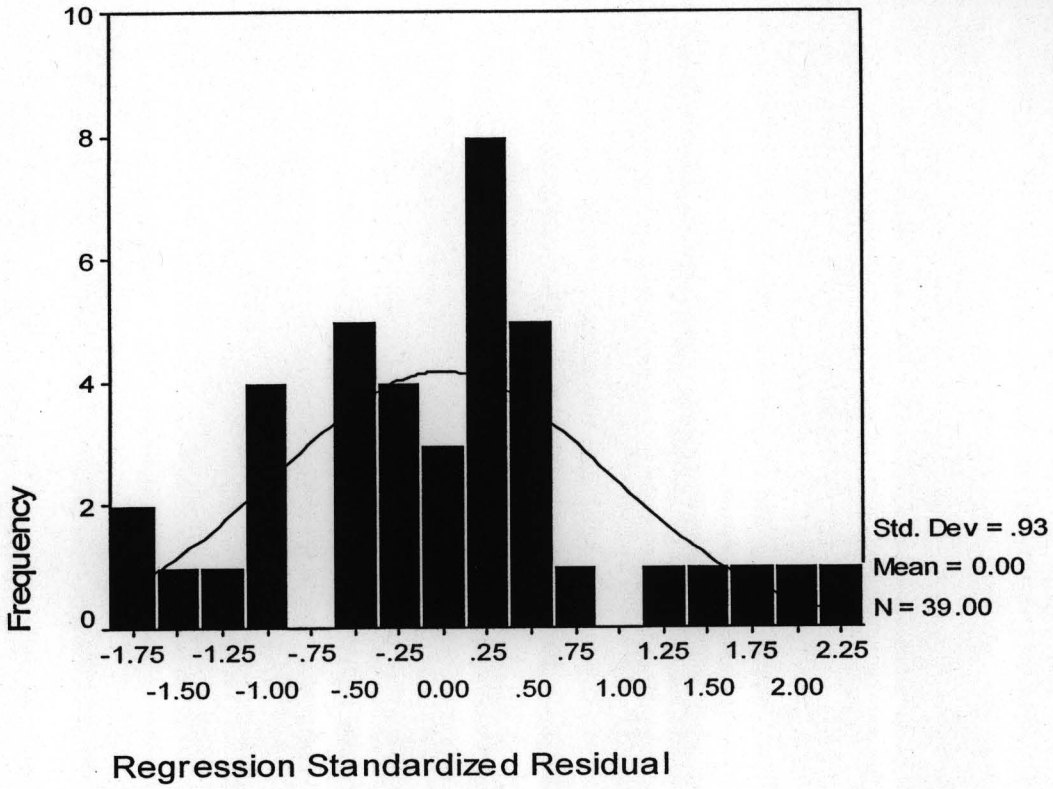


Figure H6: Normal Probability (P-P) Plot for Standardized Residual for Variables Regressed on DTMI