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THE ROLES OF PHARMACISTS, PATIENTS, AND CONTEXTUAL CUES IN PHARMACIST - PATIENT COMMUNICATION

by

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ABSTRACT

The primary goal of this study was to identify variables which affect Pharmacist - Patient Communication and test their effects in community pharmacy practice using a Model of Pharmacist - Patient Communication. The secondary goal was to explore patients' evaluation of Pharmacist - Patient Communication using Bitner's Model of Service Encounter Evaluation.

Data were collected through unobtrusive observation, patient interviews, and pharmacist interviews in 12 community pharmacies. Random samples of 30 patients who received a prescription from a volunteer pharmacist were selected at each of the 12 pharmacies, yielding a total sample size of 360.

Hypothesized relationships for Pharmacist Counselor Role Orientation (CRO), Patient Counselee Role Orientation (PRO), Lack of Time, Patient Privacy, Prescription Transfer, and Importance of Information (independent variables) with Occurrence of Communication (a dependent variable) were tested using discriminant analysis. Relationships for the independent variables with Length and Content of Communication were tested using multiple regression analysis. The hypothesized relationship between disconfirmation of expectations and satisfaction, posited by Bitner's Model of Service Encounter Evaluation, was tested using one-way analysis of variance.

Of the 360 patients who were observed and asked to participate in an

interview, 304 (84 percent) provided useable responses. Twenty-three pharmacists at the 12 pharmacy sites participated in this study. All 23 provided useable responses to their interviews.

Significant relationships, in the hypothesized directions, were found for each of the six independent variables with Occurrence of Communication. Significant relationships were found for Importance of Information and PRO with both Length and Content of Communication.

Patients who reportedly had their expectations for communication exceeded (positive disconfirmation), reported the highest satisfaction with communication. Consistent with the model, respondents who had their expectations exceeded received significantly longer communications and more content conveyed than other respondents.

In conclusion, Prescription Transfer, Importance of Information, and PRO were identified as key variables for study in Pharmacist - Patient Communication. Also, support was found for Bitner's Model of Service Encounter Evaluation applied to patients' evaluation of Pharmacist - Patient Communication. Interventions for improving communication between pharmacists and patients can be developed based on the results.

I. INTRODUCTION

All too frequently, the patient is met by a clerk, who delivers the prescription to the pharmacist, who resides in splendid isolation within a glass enclosure. After an inordinately long time (during which the patient often wanders about and buys other items to relieve his boredom) the clerk returns with the medication and rings up the sale. I've even seen the entire transaction completed without any verbal exchange whatsoever! This is poor retailing even without mention of pharmacy practice.

Although this picture of the pharmacist is not universal, it is common enough so that the pharmacist has lost professional stature with physicians and the public. Only when pharmacists really provide professional services and inform physicians and the public of their active role in patient care will the image improve.

- David J. Crosby, M.D. in The New England Journal of Medicine, pp. 331-332, August 7, 1969.

There are an awful lot of sales clerks transferring bagged meds to the patient at the check out. In a busy store that is almost a necessity - what's the deal?

- Anonymous pharmacist's comment in a questionnaire concerning Wisconsin's regulation about pharmacist transfer of medications to patients and provision of appropriate patient consultation, Spring 1992.

The Problem of Drug Misadventuring

Over half of the 1.8 billion medications prescribed each year may be taken incorrectly and result in one-sixth of all hospital admissions, over one-fourth of nursing home admissions, almost 2.5 million serious medical emergencies per year, and about 28 percent of all malpractice suits (National Council on Patient

Information and Education 1991, National Council on Patient Information and Education 1990, Perrin 1988). The abuse of prescription drugs results in more injuries and deaths to Americans than all illegal drugs combined (Perrin 1988). Also, improper use may be related to over 50 percent of the failures of prescription medication therapy (American Pharmaceutical Association 1990) and costs the economy between 10 and 15 billion dollars per year (National Council on Patient Information and Education 1991).

Manasse proposed the term "drug misadventuring" to cover the broad array of phenomena associated with negative drug experiences (Manasse 1989a, Manasse 1989b). He defined drug misadventuring as a hazard or incident: (1) which is an inherent risk when drug therapy is indicated, (2) which is created through either omission or commission by the administration of a drug or drugs during which a patient is harmed, (3) whose outcome may or may not be independent of the pre-existing disease process, (4) which may be attributable to error, immunological response, or idiosyncratic response, and (5) which is unexpected and thus unacceptable to patient and prescriber. According to Hepler and Strand (1990), drug misadventuring can result from: (1) inappropriate prescribing, (2) inappropriate delivery, (3) inappropriate behavior by the patient, (4) patient idiosyncracy, and (5) inappropriate monitoring. For the purposes of this study, drug misadventuring not only includes issues of harm (safety), but also issues of treatment failure (efficacy).

For example, a patient who took tetracycline with an antacid, which inhibits the absorption of the drug, would have experienced a drug misadventure if the condition treated was not cured.

Examples of research conducted on drug misadventuring are presented in Appendix A. Manasse (1989a, 1989b) argued that studies conducted in the United States related to drug misadventuring have been inadequate. However, the research presented in Appendix A gives sufficient evidence that drug misadventuring is a serious problem. In those studies, noncompliance ranged between 4 and 77 percent, medication errors between 25 and 90 percent, and the incidence of adverse drug reactions between 2 and 51 percent. These wide ranges may be due to differences in study methods, but also may be due to the variety of medications, disease types, and populations studied.

Pharmaceutical Care: A Solution to Drug Misadventuring

According to Hepler and Strand (1990) "pharmaceutical care" can improve health care outcomes and decrease costs by preventing or detecting and resolving drug-related problems that can lead to drug misadventures, both by increasing the effectiveness of drug therapy and by avoiding adverse effects. Hepler and Strand (1990) defined pharmaceutical care as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life."

This involves three major functions: (1) identifying potential and actual drug-related problems, (2) resolving actual drug-related problems, and (3) preventing potential drug related problems.

Although more research is needed to show pharmaceutical care decreases the problem of drug misadventuring and is more effective than other solutions, there is evidence to justify pharmacy's claim of a mandate to help the patient obtain the best possible drug therapy and especially to protect the patient from harm (Brushwood 1991, Kessler 1991, Hepler and Strand 1990). Examples of research conducted on the effects of pharmaceutical care (i.e. pharmacist interventions) are presented in Appendix B. Researchers in these studies reported that pharmaceutical care can increase appropriate use of medications, compliance, patient knowledge, understanding and recall of medication regimens, therapeutic outcomes (e.g. blood pressure control), patient satisfaction, patient acceptance of medical care, and quality of life (e.g. increased school attendance). Also, pharmaceutical care can decrease adverse drug reactions, number and cost of medications, emergency room visits, hospitalizations, length of stay in hospitals, and overall health care costs.

Most of these studies were limited in scope, utilized different methods, and compared the provision of a component of pharmaceutical care with doing nothing at all. However, the results of these diverse studies did support the assumption that pharmaceutical care can improve outcomes and reduce costs of health care.

Research Problem: Facilitation of Pharmacist - Patient Communication (A Part of Pharmaceutical Care)

In the previous section, pharmaceutical care was proposed as a possible remedy for the problem of drug misadventuring. An important part of pharmaceutical care, which was the focus for this study, is verbal communication between the pharmacist and his or her patient (also referred to as counseling or consultation).

Most prescription errors detected by pharmacists are discovered during verbal communication between the pharmacist and patient (Davis and Cohen 1992). Communication between pharmacist and patient is an important precursor to patient understanding, acceptance, and appropriate use of medication and improved therapeutic outcomes (Brown, Necsary, and Lindsey 1978; Hammarlund, Ostrom, and Kethley 1985; Wiederholt and Schommer 1991).

Researchers reported compliance with a drug regimen primarily is determined by the nature and quality of practitioner-patient communication (Svarstad 1986, Svarstad 1987). Ley (1988) reported that improved communication between a practitioner and his or her patient increased: (1) patient knowledge and recall, (2) patient satisfaction, (3) genuinely informed consent, (4) patient compliance, and (5) the speed of recovery from illness. The practitioner in these studies was the physician, but the results can apply to pharmacist - patient communication.

Based on these findings, pharmacist - patient verbal communication is a necessary component of effective pharmaceutical care. Although health professionals endorse communication between practitioners and patients (Kimberlin 1989), researchers report that the prevalence of pharmacist - patient communication often is low. Examples of research conducted on the occurrence of pharmacist - patient communication are presented in Appendix C.

In a recent article, the authors reviewed the literature and reported the proportion of patients who received no verbal consultation for original prescriptions ranged between 17 and 30 percent for physicians and between 30 and 87 percent for pharmacists (Wiederholt, Clarridge, and Svarstad 1992). Researchers of one study reported "that one of the public's most prevalent perceptions is that the pharmacist hides behind a specialized counter in a corner of the establishment, makes a little bit of noise, and comes up with a small bottle and a large bill" (Dichter Institute 1973). The main recommendation from that study was "that communication has to be reestablished between the public and the pharmacist" (Dichter Institute 1973).

In light of the apparent need for communication between pharmacists and patients to be increased, the research problem investigated in this study was how pharmacist - patient communication can be facilitated. Two goals were used to help study the research problem. The first goal comprised the primary focus of this study, while the second goal was exploratory.

The first goal was to identify variables which affect pharmacist - patient communication and test their effects in community pharmacy practice. This goal was based on the assumption that pharmacist - patient communication will be facilitated if barriers to communication can be decreased or eliminated.

A number of barriers which can disrupt the communication process between a pharmacist and patient have been identified by researchers. These include: the pharmacy environment, patient perceptions and expectations, pharmacist perceptions, interprofessional conflicts, limitations on information available to pharmacists, gaps in pharmacy training, and administrative, economic and time constraints (American Pharmaceutical Association 1990, Beardsley 1989, Carroll and Gagnon 1984, Hammel 1989, Kusserow 1990, Mason and Svarstad 1984, Ranelli 1979).

Although researchers have conducted studies to learn more about barriers to pharmacist - patient communication relating to the pharmacist side of the dyad, few have been conducted on the patient side of the dyad. Since patients initiate about 40 percent of pharmacist - patient communications (American Pharmaceutical Association 1990), the patient side of the communication dyad should be investigated, too. Therefore, for this study, pharmacist - patient communication was investigated from both the pharmacist and patient sides of the communication dyad.

Also, the role of contextual cues (often referred to as environmental or

situational factors) in pharmacist - patient communication has not been investigated extensively or in conjunction with pharmacist and patient variables. Therefore, the role of contextual cues in pharmacist - patient communication was included for study, while also considering pharmacist and patient variables.

The second goal was to explore patients' evaluation of pharmacist - patient communication. Patients' evaluation of communication is important to explore because it could affect the occurrence of future communication. According to one author, 96 percent of dissatisfied consumers never complain, but at least 90 percent who are dissatisfied will not come back and each of those who will not come back will tell his or her story to at least nine other people (Shepherd 1991).

In summary, pharmaceutical care was proposed as a possible remedy for the problem of drug misadventuring. Since an important part of pharmaceutical care is pharmacist - patient communication, the primary purpose of this study was to investigate variables which may affect verbal communication between pharmacists and patients in community pharmacies. The results can help identify ways to increase pharmacist - patient communication and presumably the amount of pharmaceutical care given to patients. In addition, exploratory research was conducted to begin to assess how patients evaluate pharmacist - patient communication and how these evaluations could affect the occurrence of subsequent communication.

II. LITERATURE REVIEW

This chapter is divided into three main sections. In the first section, theoretical frameworks proposed and used in the study of practitioner - patient communication are assessed for use in this study. The second section contains the development of a model of pharmacist - patient communication used to accomplish the first goal of this study. The last section presents a model of service encounter evaluation which was used to accomplish the second goal of this study.

Theoretical Frameworks

Many theoretical frameworks have been proposed and used in the study of practitioner-patient communication. Some of these include: Health Communication Model (Svarstad 1986), Social Learning Theory (Bandura 1986), Biomedical Model, Rational Decision Making Theory, Health Belief Model, Theory of Reasoned Action, and Self Regulative Systems (Leventhal and Cameron 1987). These models are useful for investigating how practitioner - patient communications can affect subsequent patient behaviors.

The focus of this study, however, was at one critical step before the focus of the frameworks listed previously: What can facilitate or inhibit pharmacist-patient communication to **occur at all**? If pharmacist-patient communication does not

occur, it is useless to study ways to enhance the content, methods, or effectiveness of communications. Therefore, the theoretical framework needed for this study is one which proposes factors which affect the occurrence of pharmacist-patient communication. A framework which proposes how patients evaluate communication is important as well since this could affect the occurrence of future pharmacist-patient communication.

No single theoretical framework was found to accomplish both goals of this study. Therefore, a model was developed based a literature review and an exploratory study to help investigate variables which may affect pharmacist - patient communication (the first goal of this study). For the second goal of this study, a model of service encounter evaluation was used to help explore patients' evaluation of communication. The rest of this chapter is devoted to the development and empirical support for these models.

Development of A Model of Pharmacist - Patient Communication

Models of Pharmacist - Patient Communication

Only three models of pharmacist - patient communication were found. Dickson and Rodowskas (1975) used a modified work-sampling technique to collect

data on pharmacist - patient communication in chain pharmacies. These data were used to test a model of pharmacist - patient communication. This was accomplished by developing a causal model that related six independent variables to the percentage of time pharmacists engaged in patient communication per hour. The six independent variables were: (1) date of pharmacist's graduation, (2) day of the week, (3) time of day, (4) pharmacist's job title, (5) average hourly prescription volume, and (6) prescription department staffing.

The largest direct effect on pharmacist - patient communication was prescription department staffing. As the number of staff **increased** (professional and nonprofessional) in the prescription department, the amount of time pharmacists devoted to patient communication **decreased**. The direct effect of the other variables on communication was low. Other significant path relationships were between prescription volume and prescription department staffing, day of the week and prescription volume, and time of day and prescription volume.

Dickson and Rodowskas' model is too general to be of use in this study because they did not use each pharmacist - patient encounter as the unit of analysis. Another limitation of their model is that they failed to consider the patient's role in the communication process.

Svarstad, et al. (1979) observed six pharmacists and four clerks dispense 1637 prescriptions to 588 outpatients at a Veterans Administration Hospital. They

reported that pharmacists' communication behavior was affected by: the patients' and pharmacists' backgrounds; the setting in which their interaction took place; physicians', co-workers', and patients' expectations and behavior; and other situational pressures such as the prescription volume.

Their results were not applied directly to this study because their data were not collected in community pharmacies. They collected data at only one hospital outpatient pharmacy. Also, their main dependent variable was the types of information conveyed to patients, while the main focus of this study is whether communication occurs or not.

Another model of pharmacist - patient communication was tested by Morris et al. (1987a) using data from a national telephone survey of 974 adult subjects. Using path analysis to test the model, they reported age has both direct path and indirect path relationships to pharmacist - patient communication (counseling). Older subjects were less likely to be counseled by their pharmacist. However, two indirect paths lead to increased counseling. First, elderly were likely to patronize independent pharmacies rather than chain pharmacies which was related to improved counseling rates. Second, the elderly were less likely to perceive the pharmacy counter as a barrier which was related to higher counseling rates. Though the direct path relationship showed lower counseling rates with increased age, choice of an independent pharmacy and having a more positive attitude about overcoming the

pharmacy counter barrier lead to greater counseling by the pharmacist. Morris et al. also tested a model of doctor - patient communication and reported the model was very different from that of pharmacist - patient communication.

Russell, Wilcox, and Hicks (1982) did not propose a model of pharmacist - patient communication, but suggested an interactionist approach for the study of pharmacist - patient communication. They defined communication as "a complex process that includes formulating thoughts into stimuli, transmitting the stimuli, and responding to the stimuli of the other person" (Russell et al. 1982). They proposed that each communication dyad is unique. Therefore, if the pharmacist remains the same person, but the patient is different in each dyadic communication, each communication episode should be considered unique. Also, they used the term "communication climate" to describe what affects the process and/or outcome of communication dyads. Based on their arguments, in the study of pharmacist - patient communication one should consider: (1) each unique dyadic encounter as the unit of analysis, (2) both pharmacist and patient roles in communication, and (3) the "climate" in which the communication occurs.

To help develop a model of pharmacist - patient communication for this study, literature published on physician - patient communication was consulted. Even though Morris et al. (1987a) reported pharmacist - patient communication and physician - patient communication are different, some results from studies of

physician - patient communication may be useful for this study. A brief review of this literature is given next.

Physician - Patient Communication

Zola (1963) reported that physician characteristics, patient characteristics, and the clinic's spatial design can affect communication between a physician and patient. Korsch and Negrete (1972) observed physician - patient communication in the pediatric clinic of a hospital. The most common barrier to communication was lack of physician concern and sympathy to the parent of the child.

Svarstad (1974) reported the results of an observational study in which communication between physicians and patients was investigated. She reported that variation in communication was associated with variations in each patient's perception of his or her role in the encounter. Also, a greater amount of information was given to patients who were receiving their drugs for the first time and for patients who asked more questions while they were interacting with the physician. The amount of instruction did **not** vary by patient education, ethnicity, age, or gender. Also, physicians did not give less information when situational demands of their work increased. There were differences in the amount of information given among the physicians in the study, but specific reasons were not reported.

A major finding was that patients offered very little feedback to the physician and asked few questions, if any, while they were in the physician's office. Patients sometimes withheld their questions due to their unwillingness to appear less intelligent and uneducated. Patients asked more questions if their physician appeared approachable. Under the condition of high physician approachability, patients who had lower education, were Spanish-speaking, male, and under 46 years of age were less likely to ask a high number of questions while they were interacting with the physician than those with higher education, were English speaking, female, and 46 or older.

Blazer (1978) identified factors which may affect the occurrence of communication between elderly patients and their physician. They were: patient anxiety, sensory deprivation, patient cautiousness, unrealistic views of the physician, and concentration on particular themes (e.g. death) in communicating with the physician.

Mathews (1983) used principles from interaction and role theory to present problems in clinical communication from three viewpoints: (1) the level of shared knowledge between participants, (2) the effect of status, role, and ideology on transactions, and (3) the regulation of communication imposed by features of the institution.

Pendleton (1983) reviewed the literature on physician - patient communication

and proposed a general model of provider - patient communication. The model consisted of three main parts: antecedents, process, and outcomes. Antecedents to communication included physician characteristics and patient characteristics within an environmental context. The process was consultation (communication). Outcomes included both the physician's and patient's satisfaction with the communication and the patient's compliance with the physician's instructions.

Bochner (1983) argued that when two or more people interact with each other, their behavior is influenced by how they define their own and one another's roles. This includes the mutual expectations that they bring to the encounter; that is, what they believe is expected of them and what they can legitimately expect of the other person in that particular context.

Problems in communication between physicians and patients may occur under conditions of role uncertainty and role non-correspondence (Bochner 1983). Role uncertainty exits when the parties are unclear about their own and the other person's legitimate expectations and obligations. Role non-correspondence occurs when both parties are clear about what they want and expect from a relationship, but fail to agree about their mutual rights and obligations.

Wasserman and Inui (1983) applied communications theory as a guideline for the systematic analysis of physician - patient communication. They focused on the relationship between communication and compliance, and communication and

patient satisfaction. Little attention was given to the antecedents of communication. They did, however, propose that physician and patient roles, expectations, and agendas can influence the content and structure of communication.

Inui and Carter (1985) reviewed the literature on physician - patient communication and reported research in this area was found in many disciplines. Based on the literature review, they presented a general model of provider - patient communication similar to the one presented by Pendleton (1983). Inputs to the provider - patient encounter that were reported to affect communication include prior experience with medical care, patient objectives for the visit, patient age, type of medical problem, the number of patient concerns, prior physician knowledge of patients' concerns, and characteristics of the physician's practice setting. Outcomes of the physician - patient encounter reportedly linked to the communication process include patient knowledge, provider - patient congruence on problems or recommendations, patient satisfaction, patient compliance with provider recommendations, and resolution of patient concerns or symptoms.

Waitzkin (1985) proposed a model of physician - patient communication. He found that physician characteristics, patient characteristics, and situational characteristics affected measures of information transmittal (time and level of technicality).

Wilson (1991) reported consultation length was determined by both physician

and patient variables. Physicians with a more positive orientation to general practice and mental health were found to have longer consultation with their patients. Also, physicians with time pressures were found to have a decreased mean consultation length.

Patients with new problems and psychosomatic or behavioral problems received longer consultations than others. The shortest consultations were seen for patients with skin problems, respiratory complaints, and infections. Also, older patients had longer consultations, after controlling for new or existing problems.

Wilson (1991) also reported relationships between consultation length and outcomes. Longer consultations were associated with lower prescribing rates, patients who reported more favorably that they were able to tell their doctor about their problem, and more dialogue about health education and prevention.

John (1991) reported that patients who rated their hospital significantly higher on the attributes of medical personnel's communicativeness and understanding, also rated the overall quality of their hospital higher. Also, with a more communicative approach, medical personnel were seen as more courteous and understanding of patients' needs and came across to the patient as more approachable.

In summary, results from research on physician - patient communication cannot directly be applied to pharmacist - patient communication due to differences in these communication processes. However, guiding principles for research on

pharmacist - patient communication can be learned. According to findings from research on physician - patient communication, a model of pharmacist - patient communication for this study should include: (1) each dyadic encounter between pharmacist and patient as the unit of analysis, (2) both pharmacist and patient perceived roles in communication, (3) the environment in which communication occurs, and (4) outcomes from the communication (e.g. patient satisfaction with the communication). To develop these ideas further, literature on pharmacists' and patients' roles in communication will be reviewed. Then, literature on the role of contextual cues (also called environment) in pharmacist - patient communication will be reviewed.

Pharmacists' and Patients' Roles in Pharmacist - Patient Communication

Solomon et al. (1985) applied role theory to dyadic interactions in service encounters. They defined a "service encounter" as face-to-face interactions between a buyer and a seller in a service setting. Any encounter is assumed to contain learned and consistent behavior patterns; each participant should enact certain behaviors (a script) in order for the transaction to proceed smoothly. They argued that communication between a service provider and a customer is interactive (reciprocal) and that the socially-defined structure of service encounters renders

provider/customer interchanges especially amenable to role theoretical analysis. Many provider/customer interface problems are due to the failure of participants to "read from a common script."

For both provider and customer, the enactment of the service scenario involves the mastery of a wide range of behaviors. On the provider side, the learning process often is explicit in the form of a training program or apprenticeship. On the other hand, the customer's burden typically is implicit. In the case of a customer's encounter with a novel situation, an idealized script may have been internalized through vicarious socialization or other past experiences.

Problems arise when there is an inconsistency with role expectations (Bochner 1983, Lennard and Bernstein 1966, Mills and Morris 1986, Solomon et al. 1985). These can be exhibited in one of two ways: (1) the provider's perception of job duties differs from the customer's expectations of those duties, or (2) the customer's conception of the customer role differs form the provider's notion of that role. For example, a patient may resent an overly familiar manner in a doctor, and a doctor in turn may bristle at the patient who performs self-diagnosis. In these examples, the role players are not reading from the same script.

Solomon et al. (1985) proposed that most expectations of roles are for ranges of behavior rather than for specific microbehaviors. Expectations may change over time as a script becomes redefined, though acceptance of a new service script

probably is facilitated by integration with the old one.

People familiar with situations often interact by rote with little conscious attention at the time. As long as the structure of a transaction is familiar, acting by rote appears to be the norm. Swan and Trawick (1978) reported that for low involvement, frequently purchased goods, more than 50 percent of the respondents in their study did not recall forming any opinion at all about the product. There was no deviation from expectations, thus no reason to engage in the cognitive effort necessary to form an evaluation. Therefore, extremes in evaluation (positive or negative) may be experienced only when some departure from expected role behavior is encountered and the abrupt cessation of acting by rote necessitates active processing.

Pharmacists' Roles in Communication

Communication between a pharmacist and patient can be viewed as a service encounter. In such an encounter, perceived roles of the pharmacist and patient can be important determinants of the occurrence of communication. Mason (1979, 1983) developed and tested a 20-item Counselor Role Orientation (CRO) scale to measure community pharmacists' perceived role (an attitude) toward patient medication counselling. The internal reliability coefficient of the scale was 0.71. Pharmacists'

CROs were related positively and significantly to the incidence of verbal instruction, interaction time, and pharmacist approachability.

Using the same data, Mason and Svarstad (1984) reported a link between pharmacists' attitudes toward medication counseling and measures of pharmacist-patient communication. These attitudes may be perceived by patients through how approachable the pharmacist seems. Also, Kirking (1984) reported that pharmacists' attitude toward counseling was the major explanatory variable of pharmacist-patient communication. Carroll and Gagnon (1984) concluded that provision of patient-oriented services by a pharmacist is affected as much by pharmacists' perceptions of consumer demand for them as by actual consumer demand.

Zelnio et al. (1984) reported a significant relationship between pharmacists' willingness and ability to provide services and the extent to which they provided services. Pharmacists providing services not only were more willing and able to do so, but worked longer hours, tended to work in apothecary or independent pharmacies, held advanced degrees, and were more involved in continuing education.

Fink et al. (1989) reported a sample of 244 pharmacists ranked "counseling patients" the most important of 16 pharmacy practice activities. Beardsley (1989) suggested that there are personal pharmacist barriers and patient barriers to the communication process. These include fears and anxieties about communication on

both the pharmacist's and patient's part.

Anderson-Harper, et al. (1992) surveyed a national sample of 771 pharmacists. Pharmacists reported spending about 20 percent of their time on patient education and counseling but desired to spend about 33 percent of their time on it. Pharmacists who were the most satisfied and most willing to communicate were owners and manager/directors. These groups also reported they had the most influence over their jobs. Respondents who did not desire to counsel were more satisfied than those who did desire to counsel. The staff pharmacist group reported a greater desire to counsel, less influence over their jobs and lower job satisfaction than owners and manager/directors. It appears pharmacists desire to communicate with their patients, but practice constraints may contribute to role conflict for pharmacists.

Patients' Roles in Communication

Spencer (1974) reported low patient expectations of pharmacist consultation services may be a reason for the lack of communication between pharmacists and patients. Yellin and Norwood (1974) reported that respondents who replied that their pharmacist offered health information without being asked had a significantly higher mean attitude score about pharmacy than those who answered they had to ask for

information or did not seek information at their pharmacy. Other variables which yielded higher attitude scores were increased age and lower education level. The type of pharmacy patronized was not related significantly to a respondent's attitude toward pharmacy.

Norwood (1975) reported that increased patient communication about drug therapy by a pharmacist can result in improved consumer attitudes about pharmacy. Gagnon (1978) reported that consumers rated the importance of most professional services given by a pharmacist less important on average than pharmacists did. He suggested that consumers may have been uninformed about the value of professional services given by a pharmacist.

Schondelmeyer and Trinca (1983) reported that some patients did not want more information about their medications and others were not willing to pay for such information. However, more than one third of a certain category of patients (those purchasing new antibiotic prescriptions) paid an amount for a counseling service which was sufficient to cover the direct costs of providing the service. Carroll (1985) reviewed the literature on consumer demand for patient oriented services in community pharmacies. He commented that these studies should be interpreted with caution because they are based on the assumption that consumers are familiar with pharmacy services. It may be that consumers have not had a chance to evaluate or try, or even become aware of pharmacy services because

pharmacists have not provided them.

Results of a study conducted by Hibbard and Weeks (1987) showed that a minority of respondents engaged in information seeking about their health care, but more than half were categorized as knowledgeable about the health care system. The elderly, who are the greatest users of health care per capita, were substantially less likely to seek information about their health. Culbertson, et al. (1988) reported a majority of patients (62 percent) preferred both written and verbal information from their pharmacist. Patients preferring verbal communication with their pharmacist more likely patronized an HMO pharmacy, were high school educated, or had prescriptions for a new medication. Patients preferring written information more likely patronized a community pharmacy, were postgraduate educated, or had prescriptions for a renewal medication.

Chewning (1992) collected data from pharmacy patrons about why people might not ask their pharmacist questions. The most common responses were: (1) patient fear/intimidation, (2) patients' lack of awareness about pharmacists' expertise, (3) lack of pharmacist accessibility (barriers), and (4) patients trust their physicians to tell them what they need to know.

The Role of Contextual Cues in Communication

Contextual cues may be considered to be any stimuli to which an individual is exposed in a pharmacy environment (the total complex of sensory stimuli available to the patient in a pharmacy) which can affect his or her cognitions and behaviors related to pharmacist - patient communication (Peter and Olson 1990). Therefore, a contextual cue is a part of the environment at a particular moment. People typically act in accordance with their reading of contextual cues (Rapoport 1982). This suggests that the contextual cues in an environment serve to communicate expected behaviors. For example, three designs of nurses stations elicited different responses from patients (Proctor 1966). In the one that was designed through an open door only one interaction between patient and nurse occurred. This compared with 5 interactions through a glass-enclosed counter and 9 over an open counter.

Kotler (1973-1974) suggested that environments can be designed to produce specific emotional effects in the consumer that enhance desired behaviors. Several examples he gave in which this has been successful included: shoe retailing, furniture retailing, bargain basement retailing, antique retailing, new homes, restaurants, airports and airplanes, psychiatric offices, and advertising agency offices. Belk (1975) argued that situational variables (contextual cues) substantially

can enhance the ability to explain and understand consumer behaviors. Researchers in social psychology reported that noise can lead to behavior changes in an environment such as insensitivity to social cues or stress (Cohen and Lezak 1977, Korte, Ympa and Toppen 1975, and Mathews and Canon 1975).

Fairbanks (1977) reported that psychiatric patients were more likely to engage in conversation when there were only two people in the room. Nord and Peter (1980) presented a behavior modification perspective in which contextual cues are manipulated to influence consumer behavior. They used the term ecological design to refer to the deliberate design of environments to modify consumer behavior (Barker 1968, Hall 1959, 1966, Sommers 1969).

Donovan and Rossiter (1982) reported that contextual cues in a store environment are represented psychologically by consumers and that these psychological representations can mediate intended shopping behaviors. Booms and Bitner (1982) suggested that contextual cues can be used to reinforce or establish an image, reposition a service, and influence consumer behavior. Polanski and Polanski (1982) reported that when pleasant music is playing softly, people tend to engage in approaching rather than avoiding behavior. Milliman (1982) reported that music tempo variations significantly affected the pace of in-store traffic flow and dollar sales volume in a supermarket. He also reported that music tempo variations significantly affected purchases and length of stay of restaurant patrons (Milliman

1986).

Feinberg (1986) reported that the presence of credit card cues in the environment increased the probability, speed, and magnitude of spending. Sundstrom (1987) reported that the amount of privacy a person experiences in an environment can contribute to his or her satisfaction with the physical environment by helping people maintain adequate control over information or interactions. Gehrt and Pinto (1991) conducted a repeated measures analysis of variance study and found that the impact of contextual cues on health care choice was significant and compared closely with the amount of contextual influence found in other service markets.

Researchers have investigated how contextual cues in a **pharmacy environment** can affect pharmacist-patient communication behaviors. Spencer (1974) reported that patient's attitudes towards pharmacy were not formed in isolation, but tended to be interrelated with facets of their pharmacy experience. Spencer found little evidence to support much of a relationship at all between patients and pharmacy staff members. Physical constraints, high volume demands on the staff's time, and an assembly line process which depersonalized the service were given as possible reasons for the lack of communication between pharmacists and patients.

Watkins and Norwood (1977) reported that pharmacists practicing in service,

traditional, and discount pharmacy environments displayed no significant differences in knowledge or attitude, but did differ significantly in regard to consulting behavior (discount lowest, service highest). This effect was independent of the age of the pharmacist. However, it was unclear whether the pharmacists' behavior in service pharmacies was the result of the pharmacist himself or due to the effect of the environment.

Ludy, et al. (1977) reported significantly more pharmacist-patient communication in satellite pharmacy settings with a private consultation room than in centralized traditional pharmacies with an open-window setting. Patients were significantly more satisfied with the satellite pharmacy and seemed to favor the private setting over the open-window. Beardsley, et al. (1977) also reported that higher privacy pharmacy environments increase the amount of pharmacist-patient communication. Ranelli (1979) reported that patients have a significantly more positive attitude toward the pharmacist when he or she was closer, at eye level, and without an obstacle between the pharmacist and patient.

Kirking (1980) found that environmental factors such as work load and type of drug dispensed may serve as contextual cues and affect the amount of pharmacist-patient communication. Polanski and Polanski (1982) reported that patients perceive their surroundings and react favorably or unfavorably as a result of the environment. They suggested that pharmacy environments should ensure contextual

cues such as privacy, a comfortable waiting area, soft, soothing colors, soft light, and soft music to facilitate communication.

Mason (1982) reported three factors which explained about 30 percent of the variance in the provision of patient oriented dispensing services. They were: independent pharmacy practice (vs. chain), conducive work environment, and time available. Windle, et al. (1982) reported that patients who patronized a clinic pharmacy reportedly were more likely to ask their pharmacist questions about their medication than those who patronized a community pharmacy. Nelson, et al. (1983) reported pharmacists in family medicine environments spent almost twice the amount of time in clinical activities as had been shown for pharmacists in chain store environments.

Carroll and Gagnon (1983) reported that pharmacists were available to answer patients' drug related questions, that pharmacists usually did not provide counseling to patients voluntarily, and that pharmacists were more likely to counsel patients who had lower educational attainment and higher drug expenditures. Cosler (1984) found that for certain drug categories of lower perceived importance by patients, there was no difference between the percentages of patients preferring the advice of a physician or a pharmacist. Overall, the pattern of preferences for the pharmacist as a source of drug information more closely resembled the pattern of a friend, neighbor, or relative and dissimilar to the pattern for a physician.

Kirking (1984) reported that pharmacists' attitude toward counseling was the major explanatory variable of pharmacist-patient communication followed by practice setting, prescriptions per hour, year of graduation, and neighborhood pharmacy location. Framm (1984) reported that use of a consultation room improved pharmacist-patient communication. Shepherd and Crawford (1987) reported patrons of independent pharmacy practice environments had higher expectations of pharmacist counseling than patrons of chain store or grocery-drug practice settings.

Beardsley (1989) suggested a number of environmental barriers to pharmacist-patient communication. One of the most obvious barriers is the level of the prescription counter separating the patient from the pharmacist. Although an elevated counter may be necessary for security reasons, this barrier may give patients the message that the pharmacist does not want to be bothered by them. Another related physical barrier is the height of the pharmacist's platform. This may convey the perception of authority or superiority to patients which can intimidate some patients and inhibit communication. Also, he proposed that administrative and time barriers can lead to communication failure.

Hammel (1989) asked pharmacists what barriers hinder providing oral consultation to patients in their practice setting. The greatest reported barrier was inadequate time. Pharmacists practicing in high volume pharmacies (100 or more

prescriptions per day) reported this most often. Excessive work loads, inadequate staffing, interruptions, lack of reimbursement, and paper work are common reasons reported for the lack of time made available for communication with patients. Other barriers reported were: nondispensing duties, do not see patient, patient disinterest or impatience, physical layout of the prescription area, third party pick ups or delivery, prescriptions given to patients by clerk, and not knowing the patient's medical or personal history.

Crowded, noisy prescription areas can inhibit pharmacist-patient communication. Fifty-nine percent of the respondents of one study reported there is not enough privacy in their pharmacy to speak with their pharmacist confidentially (Starr 1990). Bergin (1990) reported that the presence of pharmacy employees or other customers reportedly stops three out of 10 patients from seeking advice about their prescriptions. Smith (1990) reported factors important to patients when seeking the advice of their pharmacist were: convenience of the service, approachability, interest and concern of the pharmacist.

Kitching and Jones (1990) emphasized the importance of a proper climate (environment) for communication. A pharmacy environment with noise, poor lighting, uncomfortable seats, a telephone conversation going on in the background, and a tired looking pharmacist present some contextual cues which inhibit pharmacist-patient communication.

A draft report of the Office of the Inspector General (Kusserow 1990) proposed that a number of barriers exist that limit the range of clinical services provided by pharmacists. These barriers were: economic (product based reimbursement and underutilization of supportive personnel), interprofessional (environmental, hesitancy to communicate and struggles for power and autonomy), informational, training, and uneven patient demand (lack of patients' knowledge about pharmacists' expertise, lack of pharmacist availability, situational impediments, and patient lack of communication skills).

Kawahara (1991) proposed a number of barriers to effective counseling. They were: structural design of the pharmacy, division of labor, patient population cultural background, information gap, pharmacist's perception of patient needs, and pharmacist's communication skills. Gardner et al. (1991) also identified barriers to communication. They identified environmental barriers (lack of privacy, phones, clerks, other customers, interruptions, counter, glass partition, displays, and distance from patient area), pharmacist barriers (being too close or too far from patient, inappropriate body movements, and inappropriate vocal characteristics), and patient barriers (emotional displays and impaired comprehension). Cardinale (1991) proposed that some barriers to pharmacist - patient communication include: lack of time, invasive music, lack of privacy, counseling distance, interruptions, and distractions.

Sitkin and Sutcliffe (1991) studied the impact of professional, organizational, and legal factors on two pharmacist behaviors: information-giving and advice-giving. Data were collected from 94 community pharmacists practicing in Texas. Results showed that both professional and organizational factors influence a pharmacist's tendency to provide patients with information. A pharmacist's sense of professional responsibility and the pharmacist's assessment that a patient's individual case sufficiently was problematic affected advice-giving behavior. Legal controls aimed at the organization did not significantly influence pharmacist behavior.

Raisch (1992a) studied relationships between pharmacist - patient communication (counseling), prescription payment methods, and practice settings for community pharmacy. Data were collected for 3766 counseling events at 26 independent and 47 chain pharmacies in New Mexico. Self-pay and Medicaid patients more frequently were counseled than capitation patients. Chain pharmacists performed higher rates of counseling than independents, but more prescriptions were dispensed by independent pharmacists than chain pharmacists in this sample.

In a survey of 43 chain and 21 independent pharmacists, Raisch (1992b) reported the most important barriers to counseling reported by respondents were excessive workload, lack of privacy, and patient attitudes.

In a pilot study, Schommer and Wiederholt (1992a) collected data from 156

managing pharmacists in southern Wisconsin about their experiences with consultation. The most frequently reported criteria pharmacists use to determine the amount and content of verbal consultation they give a patient were: (1) patient intelligence/mental capacity, (2) patient's experience with the medication (e.g. original vs. renewal prescription), (3) type of medication, (4) importance of the information, and (5) patient receptiveness.

The most frequently reported barriers that make it more difficult to provide consultation to patients were: (1) not enough time, (2) no private consultation area, (3) patients don't want consultation, (4) patient not available, and (5) lack of technical support. The most frequently reported factors that make it easier to provide consultation to patients were: (1) pharmacist professionalism, (2) patient demand and receptivity, (3) privacy, (4) enough time available, and (5) the importance of the information.

Some pharmacies are being remodelled to include contextual cues which make the environment more conducive to pharmacist-patient communication (Gannon 1991). At Big B Inc., for example, there are plans to create a new physical environment that will "take the pharmacists out of glass cages." Walgreen Co. and K Mart, are remodelling pharmacies to allow more privacy for the patient to speak with the pharmacist.

Contextual cues which can affect the occurrence of pharmacist - patient

communication are summarized in Appendix D. They have been categorized as "physical evidence" or "process" contextual cues. Based on work by Bitner (1991), "physical evidence" consists of the area in which pharmacist - patient communication takes place and any tangible commodities that facilitate the occurrence or performance of the service. "Process" is the actual procedures, mechanisms, and flow of activities under which pharmacist - patient communication occurs. Physical evidence cues do not change, whereas process cues may change over the course of a pharmacist's work day.

In summary, a model of pharmacist - patient communication useful for this study would reflect the relationships of pharmacists' perceived counselor role orientation and patients' perceived counselee role orientation with pharmacist - patient communication. Also, the model should reflect the role contextual cues may have on the occurrence of communication. For example, if both the pharmacist and patient have positive role orientations towards communicating with each other about a medication, a greater likelihood of communication should result. However, a contextual cue may affect this predicted result. If the medication dispensed to the patient has been taken by the patient for many years, and the pharmacist knows this, the pharmacist may determine that the patient does not need consultation. In the same situation, the patient could be offended if the pharmacist would start to communicate with him or her about the medication.

From the literature reviewed previously, a relatively long list of variables could be generated for inclusion in this study as independent variables. Also, researchers reported conflicting results for which of these variables is most important for pharmacist - patient communication to occur. In order to identify the most important variables for this study, an exploratory study was necessary. Therefore, the final step in the development of the model used for this study was to explore pharmacists' views of consultation (communication with patients about medications). Results of a study conducted by the author and Wiederholt on pharmacist consultation (Schommer and Wiederholt 1992a) helped clarify how to measure pharmacists' and patients' role orientations for consultation. Also, the results helped identify which contextual cues should be included in the model for this study. After the relevant results from the exploratory study are presented, the final form of the model will be given.

Exploratory Study of Pharmacists' Views of Consultation

The final form of the questionnaire used for the exploratory study contained four parts and is presented in Appendix E. The first part asked pharmacists about which elements of consultation were important under different situations. The second part asked pharmacists about their experiences with consultation. In the third

part, they were asked about their perceived role as a consultant. The last part asked them demographic information about themselves and their pharmacy practice. Methods used for the exploratory study have been reported elsewhere and are not repeated here (Schommer and Wiederholt 1992a, 1992b, 1992c; Wiederholt, Schommer, and Brushwood 1992).

Of the 708 pharmacists who were asked to participate in the exploratory study, 697 provided useable responses for a response rate of 98 percent. Because the focus of the model being developed is pharmacist - patient communication in community pharmacies, only pertinent data collected from 486 (70 percent) of the respondents, who reportedly were community pharmacists, are reported here. For more in-depth analysis and discussion for the overall exploratory study sample, reports referenced in the preceding paragraph can be consulted.

Results from the first part of the questionnaire helped investigate elements of consultation important under different situations. Three matched pairs of situations were designed to help make specific comparisons. Table 1 contains comparisons for eight elements of counseling between Situation 1 (new Amoxicillin prescription and patient lacks familiarity with the medication) and Situation 2 (refill for Amoxicillin and patient is familiar with the medication). Four elements were significantly different with p-values less than 0.01. Pharmacists reportedly rated the name of the medication and purpose, directions for use and storage, side effects, and

TABLE 1

IMPORTANCE OF ELEMENTS OF PATIENT COUNSELING REPORTED BY PHARMACISTS FOR SITUATIONS 1 AND 2

Dimension	Situation 1 N = 91 (mean)	Situation 2 N = 81 (mean)	p-value
Name of medication and purpose	8.4	5.9	.000**
Directions for use and storage	9.5	7.5	.000**
Side Effects	7.4	6.2	.002*
Interactions with other medications	6.1	5.4	.087
Contraindications	6.4	6.4	.984
Administrative	5.6	4.4	.000**
Continuity of Therapy	6.6	5.9	.145
Monitoring	7.2	7.5	.356
Other	10 responses	16 responses	

* = significant at $p < .01$
** = significant at $p < .001$

Situation 1 = New Amoxicillin prescription and patient lacks familiarity with the medication

Situation 2 = Refill for Amoxicillin and patient is familiar with the medication

administrative (price, generic availability, refills) more important for Situation 1 than Situation 2.

Table 2 contains comparisons for eight elements of counseling between Situation 3 (Feldene, a prescription only nonsteroidal anti-inflammatory agent) and Situation 4 (Advil, an OTC nonsteroidal anti-inflammatory agent). Only one element was statistically significant: directions for use and storage was rated more important for Situation 3 than Situation 4. It appears that pharmacists do not use the Prescription vs. OTC distinction for determining the importance of elements of counseling.

Table 3 contains comparisons for elements of counseling between Situation 5 (pharmacist busy/serious situation) and Situation 6 (pharmacist not busy/no serious situation). All the elements were significantly different except two elements (continuity of therapy and monitoring). So, six elements were significantly different. This reflects the serious situation facing that particular patient who received an aspirin prescription while taking warfarin. It should be noted that one element (administrative) was rated higher for situation six than for situation five.

In summary, respondents placed more or less importance on elements of counseling depending on the particular situation they encountered. Based on the results, two important contextual cues to include in the model of pharmacist - patient communication are: (1) whether the prescription dispensed is an original or

TABLE 2

IMPORTANCE OF ELEMENTS OF PATIENT COUNSELING REPORTED BY PHARMACISTS FOR SITUATIONS 3 AND 4

Dimension	Situation 3 N = 77 (mean)	Situation 4 N = 76 (mean)	p-value
Name of medication and purpose	8.2	7.2	.019
Directions for use and storage	8.9	7.8	.004*
Side Effects	8.3	8.4	.748
Interactions with other medications	6.9	5.9	.063
Contraindications	7.3	7.6	.509
Administrative	5.3	4.5	.055
Continuity of Therapy	6.6	5.8	.038
Monitoring	6.8	6.7	.706

Other	11 responses	11 responses	

* = significant at $p < .01$

Situation 3 = Feldene, a prescription only nonsteroidal anti-inflammatory agent

Situation 4 = Advil, an OTC nonsteroidal anti-inflammatory agent

TABLE 3

IMPORTANCE OF ELEMENTS OF PATIENT COUNSELING REPORTED BY PHARMACISTS FOR SITUATIONS 5 AND 6

Dimension	Situation 5 N = 76 (mean)	Situation 6 N = 85 (mean)	p-value
Name of medication and purpose	7.8	4.3	.000**
Directions for use and storage	6.5	4.8	.002*
Side Effects	8.4	5.4	.000**
Interactions with other medications	9.6	5.9	.000**
Contraindications	9.4	5.9	.000**
Administrative	3.1	4.8	.000**
Continuity of Therapy	7.1	6.4	.131
Monitoring	7.8	7.2	.184

Other	28 responses	10 responses	

* = significant at $p < .01$
** = significant at $p < .001$

Situation 5 = Pharmacist busy/serious situation

Situation 6 = Pharmacist not busy/no serious situation

a renewed prescription (original or renewed prescriptions also are referred to as new or refill, respectively) and (2) the importance of the information about the prescription for a particular patient perceived by the dispensing pharmacist.

Data from the second part of the questionnaire were content analyzed following procedures set forth by Kassarjian (1977) and Kolbe and Burnett (1991). Results helped investigate pharmacists' experiences with consultation. Table 4 presents the frequencies and percents of the responses to the open ended question: "What criteria do you use to determine the amount and content of verbal consultation you give a patient?". Inter-judge reliability for this question was 0.97. The most common response was "Patient Motivation" (40 percent of responses), followed by "Type of Medication(s)" (30 percent), "Patient Abilities" (26 percent), "Time Available for Communication" (4 percent), and "Patient Not Available" (< 1 percent). Based on these results, variables which should be considered for inclusion in the model of pharmacist - patient communication include: patient motivation for counseling, type of medication(s) dispensed, and patient abilities.

In response to "for most patients you see in your practice, what do you believe is most important to give - verbal, written, or both verbal and written consultation," 292 (61 percent) of the 476 pharmacists who responded to this question reported "both." One-hundred seventy-five (37 percent) reported "verbal only" and only 9 (2 percent) reported "written only." Most comments to this

TABLE 4
CRITERIA USED BY PHARMACISTS TO DETERMINE THE AMOUNT AND CONTENT OF VERBAL COUNSELING FOR A PATIENT

N = 1124*

CRITERIA	FREQUENCY	PERCENT
Patient Motivation	454	40%
Type of Medication(s)	334	30%
Patient Abilities	291	26%
Time Available for Communication	41	4%
Patient Not Available	4	<1%
	1124	100%

* N = 1124 criteria for the 486 pharmacists in the sample because up to three criteria were accepted from each respondent.

question were that one type of consultation reinforces the other. This result confirms that pharmacists believe verbal communication between a pharmacist and patient is important.

For the questions about barriers and facilitators to consultation, inter-judge reliabilities were 0.97 for barriers and 0.97 for facilitators coded by the four general categories. They were 0.94 for the specific barrier categories and 0.92 for the specific facilitator categories.

Table 5 contains frequencies and percents of responses given by pharmacists about what barriers exist that make it more difficult for them to provide consultation to patients. Based on the most frequent responses given for this question, pharmacists perceived that they do not have enough time to communicate with patients and fulfill other responsibilities of the dispensing process. Pharmacists also reportedly believe that lack of a private consultation area and patient attitudes toward consultation with a pharmacist can prevent communication between the pharmacist and patient.

Table 6 contains frequencies and percents of responses given by pharmacists about what facilitators exist that make it easier to provide consultation to patients. Pharmacists reported providing consultation to patients was easier when they had enough time to provide it, knew the patient, and encountered a patient who demanded or appreciated consultation. Also, they reported that having a

TABLE 5
PHARMACISTS' RESPONSES TO THE QUESTION: IN YOUR PHARMACY PRACTICE, WHAT BARRIERS MAKE IT MORE DIFFICULT TO PROVIDE CONSULTATION TO PATIENTS?
N = 819*

RESPONSE CATEGORY	FREQUENCY	PERCENT WITHIN GENERAL CATEGORY	PERCENT OVERALL
PROCESS	500		61%
Time	374	75%	46%
Privacy	108	22%	13%
Reimbursement	13	3%	2%
Prescription Transfer	4	1%	<1%
Resources	1	<1%	<1%
PATIENT	200		24%
Patient Motivation	93	47%	11%
Patient Abilities	79	40%	10%
Patient Availability	28	14%	3%
PHYSICAL EVIDENCE	111		14%
Physical Layout	72	65%	9%
Private Area	39	35%	5%
PHARMACIST	8		1%
Pharmacist Professionalism	6	75%	1%
Pharmacist Approachability	1	13%	<1%
Pharmacist Knows Patient	1	13%	<1%

* N = 819 barriers for the 486 pharmacists in the sample because up to three barriers were accepted from each respondent.

Note: Percentages have been rounded to the nearest whole percent.

TABLE 6
PHARMACISTS' RESPONSES TO THE QUESTION: IN YOUR PHARMACY PRACTICE, WHAT FACTORS MAKE IT EASIER TO PROVIDE CONSULTATION TO PATIENTS?
N = 752*

RESPONSE CATEGORY	FREQUENCY	PERCENT WITHIN GENERAL CATEGORY	PERCENT OVERALL
PROCESS	265		35%
Time	145	55%	19%
Resources	57	22%	8%
Prescription Transfer	43	16%	6%
Privacy	19	7%	3%
Other (Management support)	1	<1%	<1%
PHARMACIST	261		35%
Pharmacist Knows Patient	128	49%	17%
Pharmacist Professionalism	102	39%	14%
Pharmacist Approachability	31	12%	4%
PATIENT	128		17%
Patient Motivation	116	91%	15%
Patient Availability	8	6%	1%
Patient Abilities	4	3%	1%
PHYSICAL EVIDENCE	98		13%
Physical Layout	78	80%	10%
Private Area	20	20%	3%

* N = 752 facilitators (factors) for the 486 pharmacists in the sample because up to three facilitators were accepted from each respondent.

Note: Percentages have been rounded to the nearest whole percent.

"professional" attitude made it easier to provide consultation.

Results from the third part of the questionnaire helped investigate pharmacists' perceived role as a consultant. Each pharmacist's responses to the eight-item Pharmacist Counselor Role Orientation (CRO) scale were summed to produce an overall CRO score. All items, except item 4, were reverse coded before summing. A large CRO score implied a more positive counselor role orientation than a small CRO score. The range of possible scores was from eight ($1 \times 8 = 8$) to 56 ($7 \times 8 = 56$).

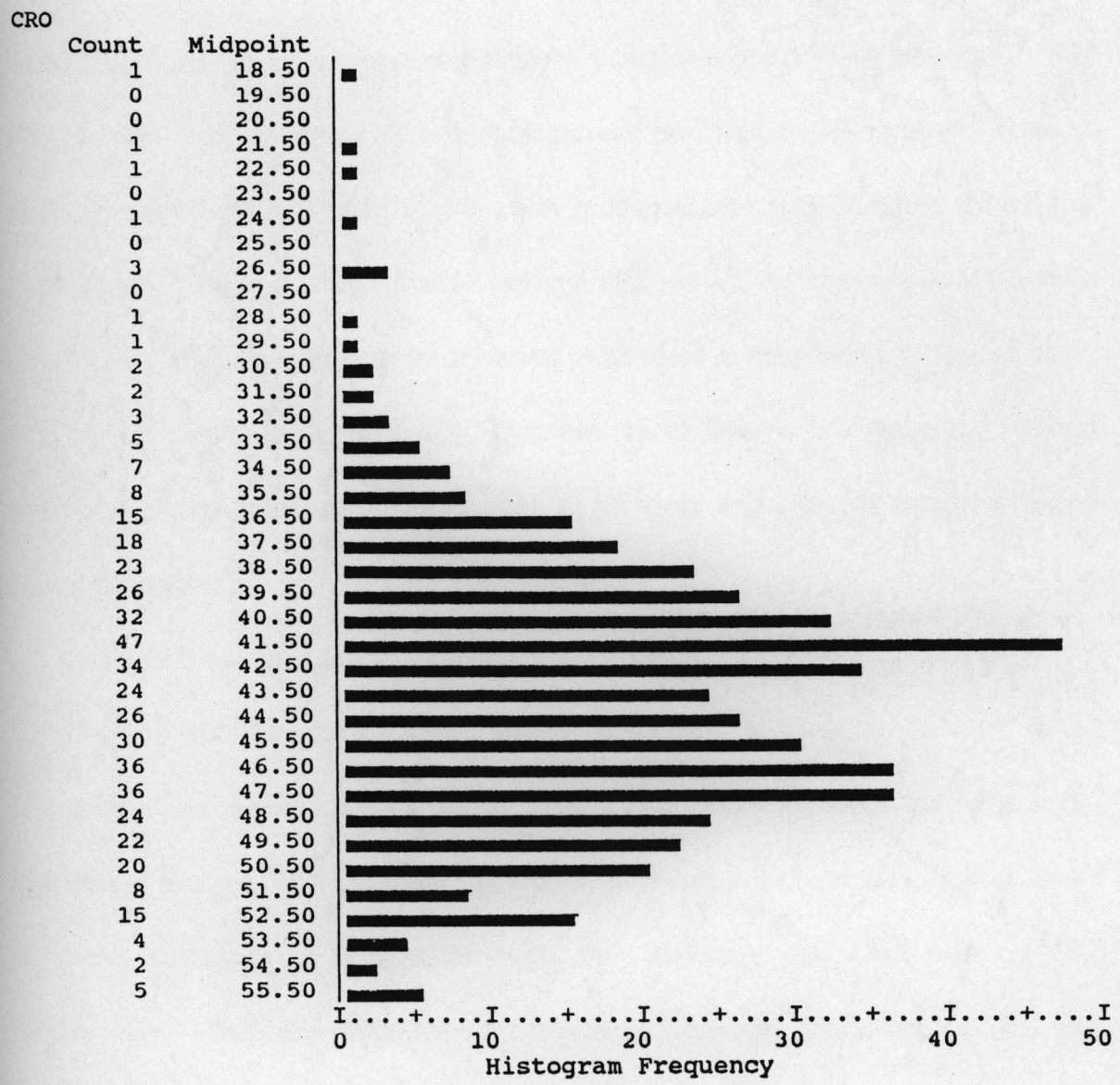
The internal reliability of this scale, computed by Cronbach's alpha (Churchill 1987), was 0.71. Most pharmacists (97 percent) had a score above the middle possible score of 32 ($4 \times 8 = 32$). This implies most pharmacists have a "positive" counselor role orientation which was expected. The distribution of the scores is given in Figure 1. The distribution appeared normal but somewhat bimodal (Marascuilo and Serlin 1988). There was a group of pharmacists that had a very positive CRO (scores = 44 through 56) and a group that had a moderately positive CRO (scores = 32 through 43). Also, there was a small group that had a negative CRO (scores less than 32).

Pharmacists in this exploratory study categorized as "very positive CRO," "moderately positive CRO," and "negative CRO," were significantly different in age (p value for F-test < 0.01) and years practice ($p < 0.02$). Younger pharmacists

FIGURE 1

DISTRIBUTION OF PHARMACIST COUNSELOR ROLE ORIENTATION SCORES FOR RESPONDENTS TO THE EXPLORATORY STUDY

N = 483



and those who practiced fewer years had more positive CROs. Respondents were not significantly different for position or average daily prescription volume. These results are similar to those reported by Mason (1979).

Table 7 contains frequencies and percentages of pharmacists' responses to who should be responsible for the risk management or risk assessment tasks given in the situations. The chi-square statistic was significant at a p-value less than .0001. Pharmacists rated provision of risk management information (Situations 1 through 3) differently than they rated provision of risk assessment information (Situations 4 through 6). Table 7 shows that 67 percent (162 of 242) of the respondents rated provision of risk management information to be more a pharmacist's responsibility than a physician's. However, only 7 percent (18 of 244) of the respondents rated provision of risk assessment information to be more a pharmacist's responsibility than a physician's.

Table 8 contains the frequencies and percents of pharmacists' responses for each of the six situations. Three situations which respondents reported were primarily a pharmacist's responsibility were: (1) affordable generic equivalent, (2) medication storage, and (3) non-prescription products which contain aspirin. Each of these situations is consistent with the definition of "risk management information." The information is drug product related and would be provided to a patient to help him or her **use** the product.

TABLE 7

FREQUENCIES OF PHARMACISTS' RESPONSES FOR WHO SHOULD BE RESPONSIBLE FOR TASKS GIVEN IN RISK MANAGEMENT AND RISK ASSESSMENT SITUATIONS

RESPONSE CATEGORY	SITUATION (a)	
	Risk Management (Situations 1-3) N=242	Risk Assessment (Situations 4-6) N=244
The pharmacist should be solely responsible	49 (20)	2 (1)
The pharmacist should be primarily responsible, but the physician should also be responsible	113 (47)	16 (7)
The pharmacist and the physician should share the responsibility equally	66 (27)	96 (39)
The physician should be primarily responsible, but the pharmacist should also be responsible	12 (5)	110 (45)
The physician should be solely responsible	2 (1)	20 (8)

chi-square = 215.3 with 4 degrees of freedom; significant at $p < .0001$

( ) signifies percentage of column total.

(a) Situation 1 = Affordable Generic Equivalent Available, Situation 2 = Medication Storage, Situation 3 = Non-prescription Products Which Contain Aspirin, Situation 4 = Allergic Reaction to Indomethacin if Allergic to Aspirin, Situation 5 = Limits on Safe Drug Use, and Situation 6 = Partial Hearing Loss from an Antibiotic

TABLE 8

FREQUENCIES OF PHARMACISTS' RESPONSES FOR WHO SHOULD BE RESPONSIBLE FOR THE TASKS GIVEN IN SIX DIFFERENT SITUATIONS

RESPONSE CATEGORY	SITUATION (a)					
	1	2	3	4	5	6
The pharmacist should be solely responsible	19	27	3	2	0	0
	(25)	(32)	(4)	(2)	(0)	(0)
The pharmacist should be primarily responsible, but the physician should also be responsible	43	39	31	9	6	1
	(57)	(46)	(38)	(11)	(8)	(1)
The pharmacist and the physician should share the responsibility equally	13	18	35	32	42	22
	(17)	(21)	(43)	(40)	(55)	(26)
The physician should be primarily responsible, but the pharmacist should also be responsible	1	1	10	36	28	46
	(1)	(1)	(12)	(44)	(36)	(53)
The physician should be solely responsible	0	0	2	2	1	17
	(0)	(0)	(2)	(2)	(1)	(20)

chi-square = 322.9 with 20 degrees of freedom; significant at $p < .0001$

( ) signifies percentage of column total.

Sums of percentages may not total 100 due to rounding.

(a) Situation 1 = Affordable Generic Equivalent Available (N=76), Situation 2 = Medication Storage (N=85), Situation 3 = Non-prescription Products Which Contain Aspirin (N=81), Situation 4 = Allergic Reaction to Indomethacin if Allergic to Aspirin (N=81), Situation 5 = Limits on Safe Drug Use (N=77), and Situation 6 = Partial Hearing Loss from an Antibiotic (N=86)

Three situations which the respondents reported were **not** primarily a pharmacist's responsibility were: (1) allergic reaction to indomethacin if allergic to aspirin, (2) limits on safe drug use, and (3) partial hearing loss from an antibiotic. Each of these situations is consistent with the definition of "risk assessment information." The information is related to patient-specific medical knowledge and would be provided to a patient to help him or her in making a **choice** about whether to use the product.

In summary, community pharmacists reportedly view their role in patient counseling as providing risk management information and the physician's role in patient counseling as providing risk assessment information. This is consistent with the view proposed by Brushwood (1991): "The evaluation of risks at the dispensing level relates primarily to risk management based on the knowledge of drugs. Only secondarily is risk assessment a factor at the dispensing level, when a pharmacist acquires knowledge about a patient of a type that a pharmacist usually would not be expected to know. Risk assessment is primarily within the physician's domain."

Results reported for the exploratory study provide insight into what factors should be included in the model of pharmacist - patient communication. Results from the first part of the questionnaire suggest that two important contextual cues to include in the model of pharmacist - patient communication are: (1) whether the prescription dispensed is an original or a renewed prescription and (2) the

importance of the information about the prescription for a particular patient as perceived by the dispensing pharmacist.

Results from the second part of the questionnaire suggest that variables which should be considered for inclusion in the model are: (1) patient motivation for counseling, (2) type of medication(s) dispensed, (3) patient abilities, (4) time pressures on the pharmacist, (5) privacy for consultation, (6) if the pharmacist and patient know one another, (7) "professional" pharmacist attitude, and (8) prescription transfer to the patient by a pharmacist.

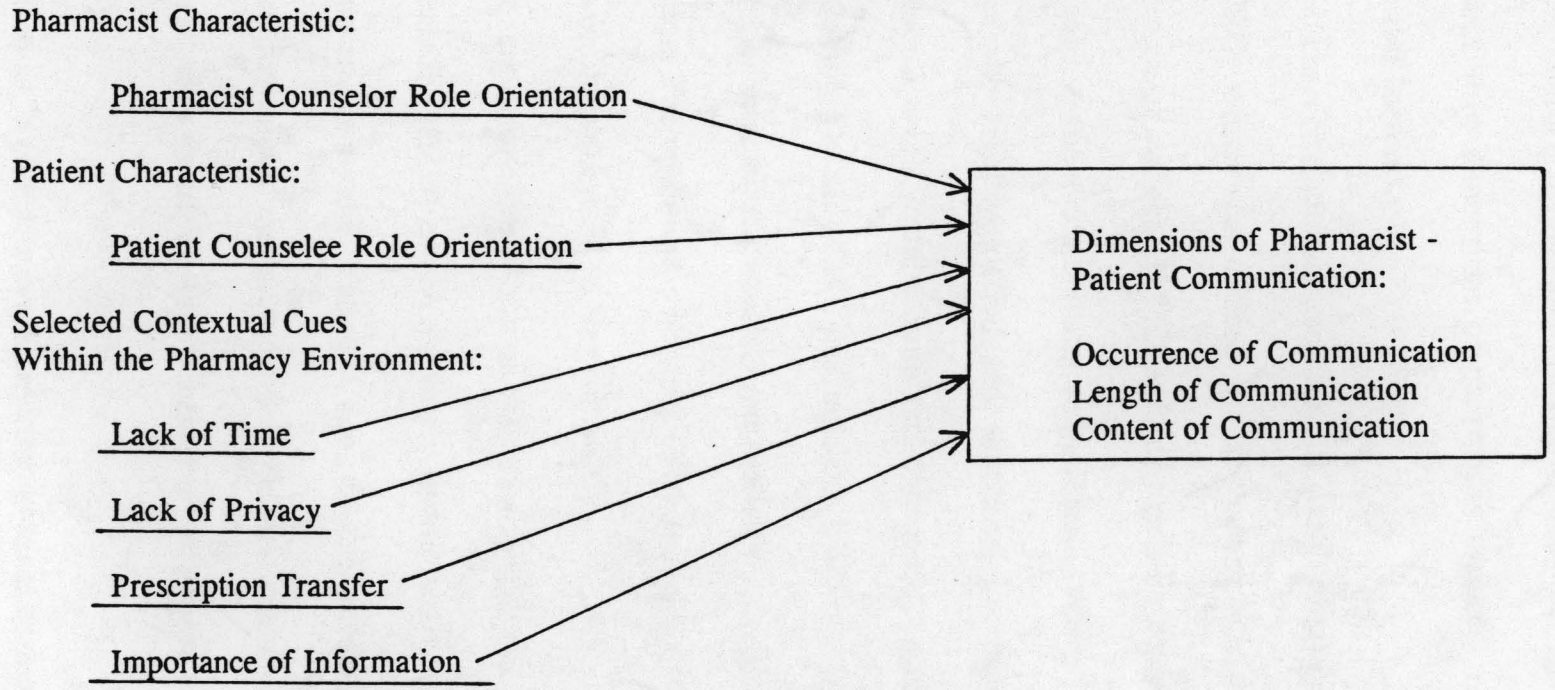
Results from the third part suggest that the eight-item Counselor Role Orientation (CRO) scale is a reliable measure of pharmacists' counselor role orientation. Results from responses to the question about who should be responsible for a counseling task suggest that pharmacists have common beliefs about tasks which are part of their role and tasks which are not.

A Model of Pharmacist - Patient Communication

The Model of Pharmacist - Patient Communication used for this study is presented in Figure 2. Variables for inclusion in the model and hypothesized relationships among the variables were based on the literature reviewed and results for the exploratory study presented earlier. According to the model, pharmacist

FIGURE 2

A MODEL OF PHARMACIST - PATIENT COMMUNICATION



characteristics, patient characteristics, and contextual cues within the pharmacy environment can affect three dimensions of pharmacist - patient communication (occurrence, length, and content).

One pharmacist characteristic was used for this study: Pharmacist Counselor Role Orientation (CRO) which was defined as "a pharmacist's overall attitude towards communicating with patients." This attitude has been shown to affect the occurrence of pharmacist - patient communication by Mason (1979). Variables such as pharmacist age are correlated with CRO and, therefore, not measured for this study. Based on Mason's work, results from the exploratory study, and a role theory perspective (Solomon et al. 1985), pharmacists' CRO was hypothesized to be a primary pharmacist characteristic which is required in a model for Pharmacist - Patient Communication. The relationship between CRO and each of the dimensions of Communication were hypothesized to be positive.

Using similar arguments based on a role theory perspective, Patients' Counselee Role Orientation (PRO) can be a primary patient characteristic which is required for inclusion in the model. Patients' age, education, and expectations, desires, familiarity, or fears about communication with their pharmacist may affect their PRO. Thus, these other variables were considered precursors to PRO and not included in this study.

PRO was defined as "a patient's overall attitude towards communication with

his or her pharmacist." This variable was operationalized (see Chapter IV) by using the same eight items which make up the CRO scale and rewording them so they were applicable to patients. This was done based on the argument by Solomon et al. (1985) which suggests that communication will be hindered when a pharmacist and patient have inconsistent role expectations. The best way to investigate inconsistent role expectations was to use parallel items to measure CRO and PRO. PRO was hypothesized to have a positive relationship with each of the dimensions of Pharmacist - Patient Communication.

Four contextual cues which may affect Pharmacist - Patient Communication are proposed by the model: (1) Lack of Time, (2) Lack of Privacy, (3) Prescription Transfer, and (4) Importance of Information. Each of these contextual cues is a "Process" cue. None of them are "Physical Evidence" cues (Process and Physical Evidence cues were defined earlier). It is desirable to have process cues in the model since the unit of analysis for this study is each pharmacist - patient encounter. By definition, Process cues can change for each encounter, but Physical Evidence cues generally remain constant over the pharmacist's workday. Therefore, the contextual cues in the model may change for each encounter, though they can be affected by Physical Cues in the pharmacy. For example, the amount of privacy in a pharmacy (a Process cue) may be affected partly by the physical layout of the prescription area (a Physical Evidence cue).

Results reported in the literature review and exploratory study suggest that lack of time is a barrier to communication between pharmacists and patients. "Lack of Time" was defined as: "extraneous work a pharmacist encounters or perceives during dispensing a prescription for a patient." Extraneous work includes interruptions a pharmacist encounters, the number of waiting patients, and the pharmacist's perceived time pressure during dispensing a prescription. According to the model, there should be a negative relationship between Lack of Time and dimensions of Pharmacist - Patient Communication.

The second contextual cue, "Lack of Privacy," was hypothesized to be an important contextual cue based upon the exploratory study and research which was reviewed previously. For this study, Lack of Privacy was defined as: "intrusion by a person other than the pharmacist or patient during dispensing a prescription for a patient." This includes crowding around the patient and the patient's perceived lack of privacy. Lack of Privacy may be affected by many variables such as: available consultation area or room, height of prescription counters, physical appearance of the pharmacy, size of the pharmacy, or how many people are in the pharmacy. For this study, Lack of Privacy is assumed to encompass these variables and to be a significant explanatory variable for the Occurrence of Pharmacist - Patient communication. According to the model, there should be a negative relationship between Lack of Privacy and dimensions of Pharmacist - Patient

Communication.

Another important contextual cue selected for inclusion in the model was "Prescription Transfer." It was defined as: "physical exchange of the completed prescription directly between a pharmacist and patient." This contextual cue may be affected by the proximity of the pharmacist's work area and patient waiting area, clerks or technicians who are involved in the exchange process, or the presence of counters or windows which may serve as barriers to transfers. For this study, Prescription Transfer was assumed to encompass the effects of these other variables. Based on previous research, the model posits a positive relationship between Prescription Transfer and dimensions of Pharmacist - Patient Communication.

The final contextual cue was "Importance of Information." Based on previously reported research, this variable may be one of the most significant contextual cues for the prediction of Pharmacist - Patient Communication. Importance of Information was defined as: "the dispensing pharmacist's and patient's judgements about the importance of communicating about a particular medication(s)." Judgements about the importance of communicating about medication(s) may depend partly upon whether the prescription dispensed was an original or renewed prescription. Importance of Information was hypothesized to have a positive relationship with the dimensions of Pharmacist - Patient Communication.

Some variables, for which researchers reported an important role in Pharmacist - Patient Communication, were not included in the model. For example, language barriers, patient abilities, patient age, and pharmacist - patient relationship were not included in the model. It is assumed that these variables may be correlated with patients' PRO scores. Also, if patients did not speak or understand English, they were omitted from this study because they would not be able to complete an interview with an English speaking researcher. The purpose of the model was not to be comprehensive. Rather, the purpose of the model was to propose an important pharmacist characteristic, patient characteristic, and contextual cues for explaining the Occurrence, Length, and Content of Pharmacist - Patient Communication.

The final portion of the model contained three dimensions of Pharmacist - Patient Communication which were dependent variables for this study. Pharmacist - Patient Communication was defined as: "any face-to-face verbal communication between a pharmacist and patient (or agent of the patient; hereafter referred to as patient) about medications or health during the dispensing of a prescription to that patient. The first dimension was the "Occurrence of Communication" (i.e. did pharmacist - patient communication occur or not?); the second was the "Length of Communication" (i.e. how long, in seconds, did pharmacist - patient communication last?); and the third is "Content of Communication" (i.e. how much, measured in types of information, did the pharmacist and patient communicate?).

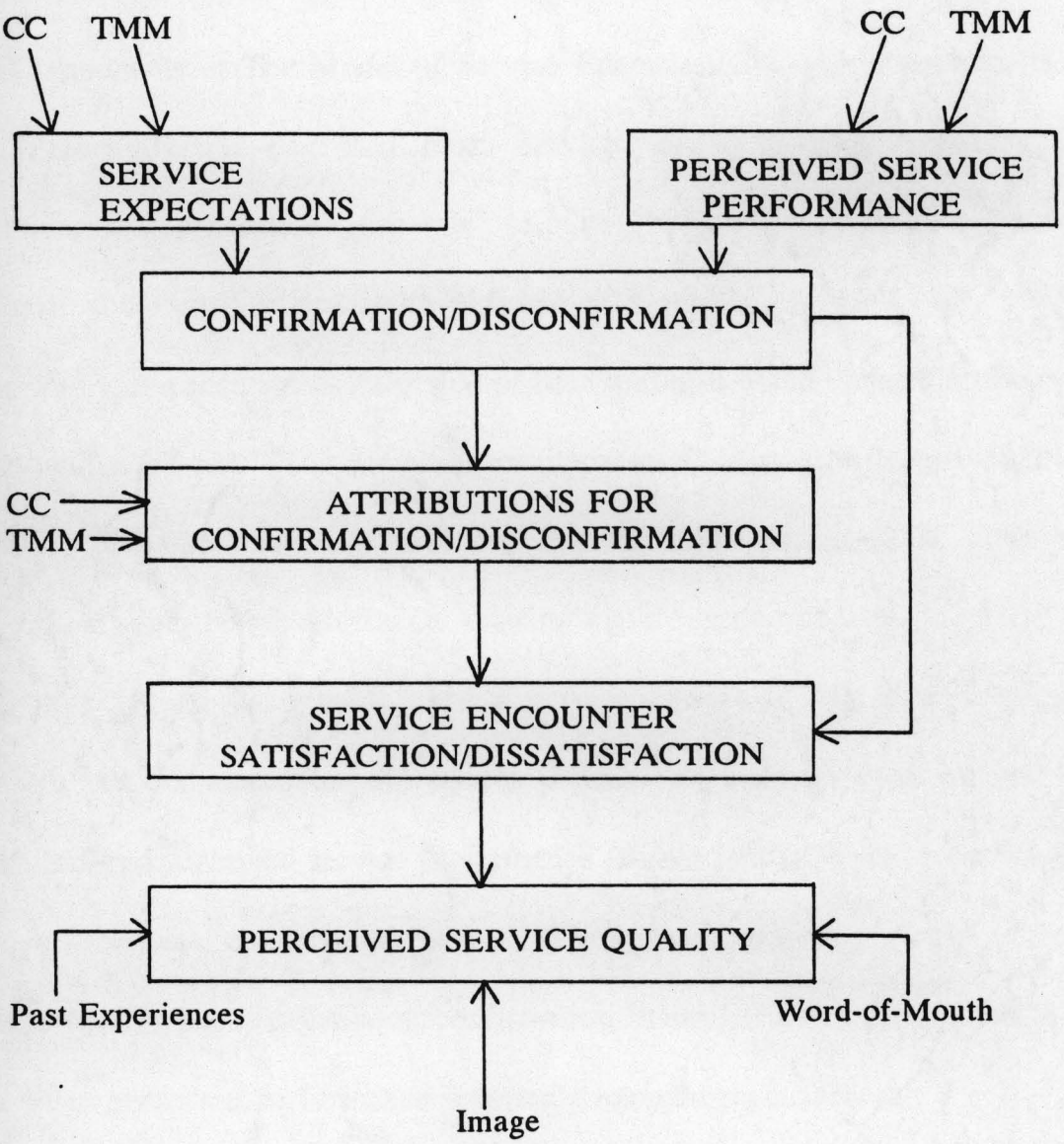
Formally stated hypotheses for relationships among the independent and dependent variables in the model are presented in the next chapter. Next, a literature review for the exploratory portion of this study is given. Exploratory research was conducted to begin to assess how patients evaluate Pharmacist - Patient Communication, which can be considered a consequence of communication. The subsequent evaluation of communication by the patient is important to explore since this could affect the occurrence and quality of future Pharmacist - Patient Communication. A useful theoretical framework for this exploratory part of the study was based on a Model of Service Encounter Evaluation (Bitner 1991) and is presented in Figure 3.

A Model of Service Encounter Evaluation

The Model of Service Encounter Evaluation presented by Bitner (1991) was based on the synthesis of literature from consumer behavior, environmental psychology and social psychology. The model relies on consumer satisfaction theories developed in the consumer behavior literature (e.g. Churchill and Surprenant 1982, Oliver 1980, Oliver and Desarbo 1988, Swan 1983) and attribution theory in the social psychology literature (e.g. Folkes 1988, Weiner 1980, 1985a, 1985b). The model also presents a hypothesized relationship between service encounter satisfaction and perceived service quality based on ideas expressed

FIGURE 3

A MODEL OF SERVICE ENCOUNTER EVALUATION



Note: CC (Contextual cues) = Physical Evidence, Process, and Participants (Pharmacist and Patient); TMM (Traditional Marketing Mix) = Product, Price, Place, and Promotion

in services marketing literature (Parasuraman, Zeithaml, and Berry 1988, Zeithaml 1987).

Components of The Model of Service Encounter Evaluation used for this study (Figure 3) are discussed next. Services are "activities, benefits, or satisfactions that are offered for sale" (Kotler 1988). Communication with a pharmacist about medications is an example of a service. Bitner (1990, 1991) defined a service encounter as "a period of time during which a consumer directly interacts with a service." This definition encompasses all aspects of the service firm with which the consumer may interact - including its personnel, its physical facilities, and other tangible elements - during a given period of time.

According to the model, after a service encounter, the first stage of consumers' service encounter evaluations depends on a comparison of service expectations and perceived service performance (Bitner 1991). When expectations match performance, confirmation occurs. When expectations reportedly exceed perceived performance, negative disconfirmation occurs. Positive disconfirmation occurs when perceived performance reportedly exceeds expectations.

The next stage of consumers' evaluations depends on their attributions for confirmation/disconfirmation. Depending on the perceived nature of the causes of confirmation/disconfirmation, consumers may modify their level of service encounter satisfaction/dissatisfaction. For example, when the consumer believes the

causes for negative disconfirmation reside with the service provider, to be within the control of the provider, and likely to occur again, the consumer will be more dissatisfied than when the opposite conditions hold (Bitner 1991). In this model, satisfaction/dissatisfaction is defined as the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the subject's prior feelings about the experience under consideration (Oliver 1981). Satisfaction is of finite duration, so satisfaction soon decays into subsequent attitudes.

The final stage of the model shows service encounter satisfaction (an affective state) influencing perceived service quality. Here, perceived service quality is viewed as equivalent to a general post-encounter attitude (Parasuraman, Zeithaml, and Berry 1988, Zeithaml 1987). Other variables, such as word-of-mouth, perceived image and past experiences, may influence perceived service quality as well (See Bitner 1991 for further discussion). Perceived service quality, in turn, may influence subsequent service expectations and service encounter behaviors.

Bitner (1991) also includes two constructs in the model that directly can influence other components of the model: traditional marketing mix and contextual cues. For goods, the traditional marketing mix has included four broad categories of variables known as the four Ps: product, price, place, and promotion (McCarthy 1960). The marketing mix has been defined as controllable variables a firm puts

together to satisfy target markets and achieve the firm's objectives (Kotler 1988). The traditional marketing mix of product, price, place, and promotion will influence the evaluation of services as it influences goods.

In 1981, Booms and Bitner first proposed the idea of an expanded marketing mix for general use for services. Because consumers of services frequently are in the service firm's "factory", interacting directly with its personnel, and observing (and sometimes interacting with) its operational systems, Bitner proposed that service firm managers have considerably more variables that may communicate with and satisfy target markets. Because of services' intangibility, consumers may look to such contextual cues as decor, design, employee appearance, newness of equipment, and apparent systems for information about the service prior to purchase (Bitner 1990, Bitner 1991).

In the model, "contextual cues" encompass three elements: physical evidence, process, and participants. "Physical evidence" consists of the area in which the service is assembled and where the provider and consumer interact; and any tangible commodities that facilitate performance or communication of the service. "Process" is the actual procedures, mechanisms, and flow of activities by which the service is operationalized and delivered. "Participants" are all human actors who play a part in service delivery and thus influence the consumer's perceptions.

Contextual cues are shown as entering the service encounter evaluation

process by directly influencing: (1) service expectations, (2) perceived service performance, and (3) attributions for confirmation/disconfirmation. Each of these effects is discussed below.

Because services are intangible and usually cannot be experimented with prior to purchase, consumers look for tangible evidence of what they are about to experience in a given service encounter (Berry and Clark 1986, Langeard et al. 1981, Shostack 1977, Zeithaml 1981). Variations in contextual cues will affect consumers' expectations of the service encounter. For example, a restaurant patron may form expectations about the quality of a restaurant based on how the restaurant looks and personnel are dressed.

Researchers in environmental psychology suggest that variations of contextual cues in the service environment can affect perceptions of the experience (Griffitt 1970, Maslow and Mantz 1956, Biggers and Pryor 1982). For example, elements of physical evidence such as noise level, odors, temperature, colors, textures, comfort in seating, and menu appearance may influence perceptions of service performance in a restaurant.

Finally, contextual cues may influence attributions for service confirmation/disconfirmation. For example, suppose a restaurant patron's expectations are not met because he or she cannot enjoy the experience due to interference of a large party of people seated near by. In such a case, **why** he or she

was seated at that particular table (controllable by restaurant personnel or not) would influence the patron's overall evaluation of the service.

Empirical Support for the Model of Service Encounter Evaluation

Researchers have reported supporting evidence for this model. Patients' service expectations and satisfaction have been found to be important determinants of repeat purchase and positive word-of-mouth behaviors (Bearden and Teel 1983, Churchill and Surprenant 1982, Halstead 1989, LaBarbera and Mazursky 1983, Oliver and Linda 1981, Oliver and Westbrook 1982). Ross et al. (1987) have suggested that expectations of and satisfaction with medical care may translate into retention and attraction of patients. Also, satisfied patients may be expected to participate in and comply with treatment, thus increasing the likelihood of successful outcomes.

Cardozo (1965) reported results of a laboratory experiment in which consumer satisfaction with a durable good (pen) was lower when the product did not meet expectations (negative disconfirmation) than when the product met expectations. Olshavsky and Miller (1972) reported that negative disconfirmation of an overstatement resulted in more favorable ratings than an understatement about a tape recorder. Both of these studies suffered from methodological flaws, however

(e.g. poor manipulations of expectations, demand artifacts, lack of interpretable control groups).

Anderson (1973) used adequate methods and investigated four theoretical models for explaining the effects of disconfirmation of expectations on satisfaction. He concluded that, for easily understood products, there is a point beyond which consumers will not accept increasing disparity between product claims and actual performance. The best theoretical explanation was assimilation-contrast which maintains that there are zones or latitudes of acceptance and rejection in consumer perceptions. If the disparity between expectations and performance is small, the consumer will tend to assimilate the difference by rating the product more in line with expectations. However, if the discrepancy is so large that it falls outside the zone of acceptance, a contrast effect comes in to play and the consumer magnifies the perceived disparity between the product and his expectations for it (Anderson 1973).

Olson and Dover (1979) defined expectations as "pretrial beliefs about the product" - i.e. the subjective probability of association between two concepts such as a product and an attribute. They conducted an experiment in which subjects' expectations were negatively disconfirmed by a controlled trial experience with the product (coffee). They reported that pretrial expectations can have a direct effect on satisfaction as well as the disconfirmation of those expectations.

Consistent with Olson and Dover (1979), Oliver (1980,1981) presented a model which expressed consumer satisfaction as a function of expectation and expectancy disconfirmation. He tested this model using a field study of a flu vaccination program. The results gave support for the effects of expectation and expectancy disconfirmation on consumer satisfaction. Swan and Trawick (1981) also found support for this model in a retail service setting (restaurant). Bearden and Teel (1983) reported that expectations and disconfirmation appear to be plausible determinants of satisfaction with automobile repairs and service.

Some researchers have reported other variables which may affect consumer satisfaction. Westbrook (1980) found support for the proposition that product satisfaction is partly a function of affective influences within the consumer, in addition to expectations and disconfirmation. Churchill and Surprenant (1982) reported that performance may have a direct effect on satisfaction with a durable good. Tse and Wilton (1988) also found that perceived product performance had a direct effect on satisfaction, but expectation and subjective disconfirmation had the greatest effect. Swan (1988) tested the hypothesis that satisfaction was related to initial expectations, disconfirmation of expectations, and perceived product performance. He reported that in addition to disconfirmation, product performance was a predictor of satisfaction and intentions.

Folkes (1984) reported that attributions (causes) of product failure influence

consumer responses to the failure. Oliver and DeSarbo (1988) tested the effects of five determinants of satisfaction with stock market scenarios. The results showed disconfirmation and performance exerted the greatest effects, followed by expectation, equity, and attribution. Jayanti and Jackson (1991) examined three models of satisfaction as applied to hairstyling services. The individual difference model performed the best, followed by disconfirmation and performance. Three individual variables were used in the individual differences model: perceived risk, involvement, and innovativeness.

Related Research Reported in the Pharmacy Literature

Some research about patients' expectations and satisfaction has been reported relating specifically to pharmaceutical and other health services. Most of these studies are descriptive in nature. Gagnon (1976) reported that as respondents' age increased, the importance of pharmaceutical services to respondents decreased. Also, as education level increased, the importance of the services to respondents decreased. Ludy et al. (1977) found that patients who randomly were assigned to a satellite hospital pharmacy reported higher expectations of pharmacist consultation than patients assigned to a traditional setting. Mackowiak and Manasse (1984) reported that patrons of an office practice pharmacy expressed significantly higher

expectation and satisfaction scores about pharmaceutical services than patrons of a traditional pharmacy. Patrons of the office practice pharmacy reported more frequent consultation with a pharmacist regarding drug therapy and health issues.

Benrimoj and Reisenwitz (1986) found that pharmacy students reportedly were more satisfied with over-the-counter drug products than non-pharmacy students. The knowledge and expertise of the pharmacy students may have contributed to the differences. Curtin (1987) reported patients who received more information in a consultation with a pharmacy student were more satisfied than those who received less.

Mackowiak and Manasse (1988) reported a significant difference in expectations for pharmaceutical services based on age. Respondents less than age 35 reported significantly higher expectations than those greater than age 65 for some of the pharmaceutical services. Those between ages 35 to 49 also had higher expectations than those 65 years or older regarding prescription information services.

Cady et al. (1989) used the disconfirmation of expectations model to evaluate the effect of providing drug information on patient satisfaction with prescription medication. They reported that providing drug information resulted in more positive disconfirmation and higher levels of satisfaction when the outcome of therapy was less than optimal. This result supported the disconfirmation of expectations model.

Brown and Swartz (1989) explored medical services quality evaluations from both the provider and patient perspectives. They found that gaps can arise from inconsistent perceptions of expectations and experiences between patients and physicians.

In summary, there is evidence that Bitner's Model of Service Encounter Evaluation can be applied to a patient's evaluation of communication with his or her pharmacist. As an exploratory step, patients in this study were asked about confirmation or disconfirmation of their expectations for communication with their pharmacist. Also, they were asked about their satisfaction for communication with their pharmacist. Using these data, the relationship between disconfirmation of expectations and satisfaction was explored. One study hypothesis for this relationship is presented in the next chapter.

III. STUDY HYPOTHESES

The first goal of this study was to identify variables which affect Pharmacist - Patient Communication and test their effects in community pharmacy practice. To accomplish this, relationships among variables proposed in the Model of Pharmacist - Patient Communication were tested. Results from these tests built upon previous research to help identify ways to increase the Occurrence, Length, and Content of Pharmacist - Patient Communication. In this chapter, formally stated hypotheses are presented for the proposed effects of CRO, PRO, and four selected contextual cues on the Occurrence, Length, and Content of Pharmacist - Patient Communication. No hypotheses are presented about interactive effects for these variables since no research or theory were found on which to base them. Interactive effects were investigated statistically and any significant effects that were found will be interpreted and discussed.

The second goal of this study was to explore patients' evaluation of Pharmacist - Patient Communication. To accomplish this, exploratory research was conducted for the relationship between patients' disconfirmation of expectations and satisfaction with Pharmacist - Patient Communication proposed by a Model of Service Encounter Evaluation. One hypothesis is presented for this proposed relationship.

Hypotheses for the Occurrence of Communication

Occurrence of Communication was a dichotomous dependent variable. Discriminant analysis was used to multivariately test the effects of the independent variables on the Occurrence of Pharmacist - Patient Communication. Hypotheses are stated in terms of the anticipated relationships proposed in the model among the independent and dependent variables. In statistical testing, corresponding null hypotheses actually were tested. Rejection of null hypotheses, in the hypothesized direction, suggested that hypotheses stated in terms of anticipated relationships were supported. The six hypotheses related to Occurrence of Communication were:

H1: There is a positive relationship between CRO and the Occurrence of Pharmacist - Patient Communication.

H2: There is a positive relationship between PRO and the Occurrence of Pharmacist - Patient Communication.

H3: There is a negative relationship between Lack of Time and the Occurrence of Pharmacist - Patient Communication.

H4: There is a negative relationship between Lack of Privacy and the Occurrence

of Pharmacist - Patient Communication.

H5: There is a positive relationship between Prescription Transfer and the Occurrence of Pharmacist - Patient Communication.

H6: There is a positive relationship between Importance of Information and the Occurrence of Pharmacist - Patient Communication.

In addition to testing these hypotheses, an extended investigation was conducted to help understand and interpret how the independent variables affect Occurrence of Communication. Methods used for extended investigation are presented in Chapter IV.

Hypotheses for the Length of Communication

Length of Communication was a continuous dependent variable. Multiple regression analysis was used to multivariately test the effects of the independent variables on the Length of Pharmacist - Patient Communication. Hypotheses are stated in terms of the anticipated relationships proposed in the model among the independent and dependent variables. In statistical testing, corresponding null hypotheses actually were tested. The six hypotheses related to Length of

Communication were:

H7: There is a positive relationship between CRO and the Length of Pharmacist - Patient Communication.

H8: There is a positive relationship between PRO and the Length of Pharmacist - Patient Communication.

H9: There is a negative relationship between Lack of Time and the Length of Pharmacist - Patient Communication.

H10: There is a negative relationship between Lack of Privacy and the Length of Pharmacist - Patient Communication.

H11: There is a positive relationship between Prescription Transfer and the Length of Pharmacist - Patient Communication.

H12: There is a positive relationship between Importance of Information and the Length of Pharmacist - Patient Communication.

In addition to testing these hypotheses, an extended investigation was conducted to help understand and interpret how the independent variables affect Length of Communication. Methods used for extended investigation are presented in Chapter IV.

Hypotheses for the Content of Communication

Content of Communication was a continuous dependent variable. Multiple regression analysis was used to multivariately test the effects of the independent variables on the Content of Pharmacist - Patient Communication. Hypotheses are stated in terms of the anticipated relationships proposed in the model among the independent and dependent variables. In statistical testing, corresponding null hypotheses actually were tested. The six hypotheses related to Content of Communication were:

H13: There is a positive relationship between CRO and the Content of Pharmacist - Patient Communication.

H14: There is a positive relationship between PRO and the Content of Pharmacist - Patient Communication.

H15: There is a negative relationship between Lack of Time and the Content of Pharmacist - Patient Communication.

H16: There is a negative relationship between Lack of Privacy and the Content of Pharmacist - Patient Communication.

H17: There is a positive relationship between Prescription Transfer and the Content of Pharmacist - Patient Communication.

H18: There is a positive relationship between Importance of Information and the Content of Pharmacist - Patient Communication.

In addition to testing these hypotheses, an extended investigation was conducted to help understand and interpret how variables affect Content of Communication. Methods used for extended investigation are presented in Chapter IV.

Hypothesis for Patients' Evaluation of Communication

According to the Model of Service Encounter Evaluation, when expectations match performance, Confirmation occurs. When expectations exceed perceived

performance, Negative Disconfirmation occurs. Positive Disconfirmation occurs when perceived performance exceeds expectations. Positive Disconfirmation of Expectations leads to higher Satisfaction than Confirmation of Expectations, while Negative Disconfirmation leads to Dissatisfaction. At this exploratory stage, only the direct effect of Confirmation/Disconfirmation of Expectations on patients' Satisfaction/Dissatisfaction with Pharmacist - Patient Communication was tested. This relationship corresponds to the direct relationship between Confirmation/Disconfirmation and Service Encounter Satisfaction/Dissatisfaction in Figure 3. Patients' evaluation of communication is important to study since it could affect the occurrence and quality of future Pharmacist - Patient Communication. Patient Satisfaction can be viewed as one of a number of consequences from Pharmacist - Patient Communication (others include compliance behaviors and clinical outcomes). To test this effect, the following hypothesis was proposed:

H19: Satisfaction/Dissatisfaction with Pharmacist - Patient Communication is significantly different among patients categorized as having Positive Disconfirmation, Confirmation, or Negative Disconfirmation of Expectations for communication.

If this hypothesis was supported (i.e. corresponding null hypothesis rejected), multiple comparison tests were planned for Satisfaction scores to investigate

significant differences among the three categories of patients. Patients categorized as having Positive Disconfirmation were hypothesized to have significantly higher Satisfaction scores than those categorized as having Confirmation of Expectations. Those having Confirmation of Expectations, in turn, were hypothesized to have higher Satisfaction scores than those categorized as having Negatively Disconfirmed Expectations.

IV. METHODS

Research Design

A cross-sectional, field study, descriptive design was used for collecting and analyzing data. Independent and dependent variables were operationalized and measured (not manipulated as in experimental design). Data were collected using observational and personal interview techniques in 12 community pharmacies located in Wisconsin.

Operational Definitions of Variables

For the major part of this study, six independent variables were used: (1) CRO, (2) PRO, (3) Lack of Time, (4) Lack of Privacy, (5) Prescription Transfer, and (6) Importance of Information. Three dependent variables were used: (1) Occurrence of Pharmacist - Patient Communication, (2) Length of Pharmacist - Patient Communication, and (3) Content of Pharmacist - Patient Communication. For the exploratory part of this study, one independent variable (Confirmation/Disconfirmation of Expectations for Pharmacist - Patient Communication) and one dependent variable (Satisfaction/Dissatisfaction with Pharmacist - Patient Communication) were used.

Independent Variables

Development of definitions for independent variables used in this study were given in Chapter II. A summary of these definitions is presented here.

CRO: a pharmacist's overall attitude towards communicating with patients.

PRO: a patient's overall attitude towards communicating with his or her pharmacist.

Lack of Time: extraneous work a pharmacist encounters or perceives during dispensing a prescription for a patient.

Lack of Privacy: intrusion by a person other than the pharmacist or patient during dispensing a prescription for a patient.

Prescription Transfer: physical exchange of the completed prescription directly between a pharmacist and patient.

Importance of Information: the dispensing pharmacist's and patient's judgements about the importance of communicating about a particular medication(s).

Confirmation/Disconfirmation of Expectations for Pharmacist - Patient Communication: the degree to which a patient's expectations for pharmacist - patient communication were or were not met.

Dependent Variables

The three dependent variables for the major part of the study related to Pharmacist - Patient Communication. Pharmacist - Patient Communication (sometimes referred to as pharmacist consultation or patient counseling) was defined as: any face-to-face verbal communication between a pharmacist and patient (or agent of the patient; hereafter referred to as patient) about medications or health during the dispensing of a prescription to that patient. A summary of definitions for dependent variables used in the major and exploratory parts of this study are presented here.

Occurrence of Communication: Pharmacist - Patient Communication was observed to take place.

Length of Communication: how long, in seconds, Pharmacist - Patient Communication took place.

Content of Communication: how many types (see Appendix I) of information were verbalized during Pharmacist - Patient Communication.

Satisfaction/Dissatisfaction with Pharmacist - Patient Communication: the summary psychological state resulting when the emotion surrounding confirmed or disconfirmed expectations is coupled with the patient's prior feelings about pharmacist - patient communication.

Measures

Measures of the variables defined previously were pretested on 30 pharmacist - patient encounters in one pharmacy before inclusion in the final data collection forms (Churchill 1979).

Pharmacist Counselor Role Orientation (CRO)

The same measure used for the state-wide pharmacist consultation survey (Schommer and Wiederholt 1992a) was used to measure CRO. This measure consisted of eight items. Pharmacists were asked to report their agreement or disagreement with each item using a seven point scale ranging from very strongly disagree to very strongly agree (see Appendix F). Scores for each item were reverse coded, except item 4, and summed to produce an overall CRO score for each pharmacist. The possible range of the overall CRO score was from 8 through 56, with 56 the most positive CRO a pharmacist may have.

Patient Counselee Role Orientation (PRO)

Patient Counselee Role Orientation (PRO) was measured using eight items parallel to the items used for measurement of CRO (see Appendix G). Patients were

asked to use the same seven point scale pharmacists used for reporting their agreement or disagreement with each item. Scores for each item were reverse coded, except item 4, and summed to produce an overall PRO score for each patient. The possible range of the overall PRO score was from 8 through 56, with 56 the most positive PRO a patient may have.

Lack of Time

Lack of Time was measured using four items (see Appendix H). The first two items were measured objectively through observation. The third item was measured subjectively by asking each pharmacist to rate, on a seven point scale how busy he or she was during the past hour, about once every hour. The pharmacist's response was used for any encounters they had with patients for that previous hour. The measurement of this item was restricted to about once per hour to help keep observation effects to a minimum. The fourth item was measured subjectively by asking each patient to rate, on a seven point scale, how busy he or she perceived the pharmacist to be. Scores for each item were summed to provide an overall score.

Lack of Privacy

Lack of Privacy was measured using two items (see Appendix H). The first item was measured objectively through observation. Scoring for this item was based on work done by Hall (1966) in which he investigated spatial zones and social interaction. The second item was measured subjectively through patient interviews. Each patient was asked to rate on a seven point scale how private he or she perceived the pharmacy to be during the dispensing of his or her prescription. After the second item was reverse coded, scores for each item were summed to provide an overall score.

Prescription Transfer

Prescription Transfer was an objective, dichotomous measure (see Appendix H). Whether or not the pharmacist transferred the completed prescription to the patient was recorded through observation.

Importance of Information

Importance of Information was measured using three items. Through patient

interviews, the name and directions of the prescription(s) were collected. Also, information about the original/renewal status of each prescription was collected. This information was coded from 1 = renewal (refill) and have been taking it for more than one year through 7 = more than one original (new) prescription (see Appendix H). This item was used as an objective measure for Importance of Information. If more than one medication was dispensed to a patient, the medication which yielded the highest score was included for the objective measure.

For the second item, patients were asked to rate the importance of communication with the pharmacist who dispensed their prescription(s) using a seven-point scale ranging from 1 = Of No Importance to 7 = Of Great Importance.

Then, the information about the prescription(s) for each pharmacist - patient encounter was transferred to a scoring sheet (see Appendix M). After all the observations and patient interviews were completed involving a pharmacist, that pharmacist was asked to rate the importance of communication. A seven-point scale ranging from 1 = Of No Importance to 7 = Of Great Importance was used for pharmacists' responses. This constituted the third item.

Scores for each of the three items were summed to provide an overall Importance of Information score. Therefore, the potential range of scores was 3 to 21, with higher scores signifying greater Importance of Information.

Confirmation/Disconfirmation of Expectations

Since this variable was used for exploratory purposes, only one item was used for its measurement. Patients were asked to respond to the question, "Was the amount of communication you had with your pharmacist today:

___ more than you expected?

___ about what you expected?

___ less than you expected?

Respondents answering "more than you expected" were categorized as Positive Disconfirmation, those answering "about what you expected" as Confirmation, and "less than you expected" as Negative Disconfirmation of Expectations.

Pharmacist - Patient Communication

Occurrence of Pharmacist - Patient Communication was measured by observing and recording whether face-to-face verbal communication did or did not occur between a pharmacist and patient. In addition, Length of Communication was measured by timing (with a stop watch) the number of seconds the pharmacist and patient engaged in face-to-face, verbal communication about medications or health. During any gaps in communication, the stop watch was turned off.

Content of Pharmacist - Patient Communication was measured by observing and recording whether or not certain types of communication took place. The types of communication are listed in Appendix I. These items were selected based on the National Association of Boards of Pharmacy model regulations regarding appropriate consultation (National Association of Boards of Pharmacy 1990), the exploratory study, and research reported by Mason (1979) and Curtin (1987).

Items which were observed during Pharmacist - Patient Communication were given a score of one. Items which were not observed during communication were given a score of zero. The sum of scores yielded the Content of Pharmacist - Patient Communication score for each encounter studied. In other words, Content of Communication was a frequency count for the number of types of information conveyed during a pharmacist - patient encounter.

Satisfaction/Dissatisfaction with Communication

Patient Satisfaction/Dissatisfaction with Pharmacist - Patient Communication was measured using three items (see Appendix J). These items were selected from a reliable scale reported by Curtin (1987). Patients, for whom communication occurred, were asked to give their responses using a seven-point semantic differential scale (See Appendix J). A Satisfaction/Dissatisfaction score was the sum

of scores for the three items. The potential range of scores was 3 to 21, with a higher score signifying greater satisfaction.

Sample

First, a judgement sample (in which sample elements were preselected because it was expected that they can serve the research purpose) of 12 community pharmacies in Wisconsin was selected (Churchill 1987). This was accomplished in conjunction with the state-wide pharmacy self-inspection project (Schommer, et al. 1992; Schommer, et al. 1990). From data collected in the self-inspection project, an effort was made to select a sample that resembled community pharmacy practice in Wisconsin. Pharmacies were selected to provide variation in geographical location and prescription volume. Participation of at least one pharmacist from each pharmacy was solicited by personally contacting each pharmacist and asking him or her to participate in this study. A letter and summary of proposed data collection procedures for the study was mailed to each pharmacist who agreed to participate in the study (see Appendix K).

A random sample of 30 patients who received a prescription from a volunteer pharmacist was selected randomly at each of the 12 pharmacies. Thus, the total number of patients included in the sample was 360. This sample size was arrived upon by considering not only requirements for statistical analyses, but also the

expected heterogeneity of the sample, and the time, money and personnel available for the study.

Before random selection of patients for data collection at a pharmacy site, the researcher, posing as a customer selecting an over-the-counter product, anonymously observed patterns of practice for that pharmacy. This included observing such things as where the pharmacists worked, processes of preparing prescriptions, who transferred prescriptions to patients, and how often communication took place. Some of these anonymous observations took place weeks before data collection and others took place on the same day of observations. Sometimes, pharmacists already knew the researcher. For these cases, observations were done unobtrusively or during a "courtesy" visit to their pharmacy even before they were asked to participate in this study. These observations were used to help ascertain if observation effects were significant when pharmacists knew they were being observed.

When the researcher was ready to begin data collection at a pharmacy, he introduced himself to the pharmacist(s) and explained he would stand in a certain area of the pharmacy, wait for patients to receive their prescription(s), and then ask some patients to participate in an interview. Also, he told pharmacists that he would ask them about once per hour how busy they are, and then would interview them after data collection was complete. If pharmacists asked about the content of

questions, the researcher would inform them they would receive a copy of the data collection forms after all the data were collected at their pharmacy.

The researcher then would leave the pharmacy to park his car and prepare for data collection. Upon re-entering the pharmacy, the researcher took his observation position and appeared to begin observations. Actually, a 10-15 minute "warm up" period was necessary to let the pharmacists get used to being observed. During the warm up period the researcher would check for observation effects on the pharmacist's behavior, draw a map of the pharmacy, take a photograph of the prescription area, and write notes about the pharmacy layout and environment. When the pharmacist appeared to settle into his or her normal routine, consistent with the routine observed before data collection presumably started, random selection of patients for actual observations and interviews began.

Random selection of 30 patients at each pharmacy was accomplished by random selection of a **time** during the first 15 minutes during which actual observations began and selecting the first patient observed after that time. Subsequent patients were selected systematically by selecting the next patient who received a prescription after the previous patient's interview was completed. The timing of patient selection depended upon how often patients entered the pharmacy and how long patient interviews were. Most patient interviews took less than five minutes to complete.

Data Collection

Three data collection instruments, pretested on 30 pharmacist - patient encounters in one pharmacy, were used. The first instrument was designed to collect data through observations of pharmacist - patient communication in pharmacies (See Appendix L). Through observation, data were collected on Lack of Time, Lack of Privacy, Prescription Transfer, and the Occurrence, Length, and Content of Pharmacist - Patient Communication. The second instrument was a personal interview questionnaire designed to collect information about pharmacists' Counselor Role Orientation and Importance of Information (see Appendix M). The third instrument was designed to collect data through personal interviews with patients as they exited their pharmacy (See Appendix N). Through personal interviews, data were collected on Patient Counselee Role Orientation (PRO), Lack of Time, Lack of Privacy, Importance of Information, Confirmation/Disconfirmation of Expectations, and Satisfaction/Dissatisfaction with Communication. Also, information was collected about the renewal status, name, and directions for prescriptions dispensed to each patient. This information was used by the dispensing pharmacist to rate "Importance of Information." Patient age, gender, and comments were recorded on the data collection instrument based on research reported by Wiederholt et al. (1992) and may be used in subsequent analyses of the data.

Data collection was accomplished from May through September 1992. Data

collection times at pharmacies depended upon pharmacists' vacation and staffing schedules. Observations were conducted in each pharmacy unobtrusively (Berardo et al. 1989, Ortiz et al. 1989, Scott et al. 1990). During all observations, the observer was at least 25 feet behind the patient and stood behind shelving so he could not be seen by the patient.

Personal interviews with patients were conducted after they had been observed and were exiting the pharmacy. To help patients answer questions, response cards were provided (see Appendix O). Identities of all patients remained anonymous and their responses were kept confidential. The researcher identified himself as a student from the University of Wisconsin doing a school project and notified patients that they had been observed by the researcher and that their responses would be kept confidential. Also, they were told their pharmacist would not see their answers; only aggregate results from all respondents. To assure patients' anonymity, their names and prescription numbers were not collected.

Pharmacists were interviewed **after** observations involving them were completed. During observations and patient interviews, pharmacists were not told what type of information was being collected. They were told that the researcher was identifying patients who received prescriptions for inclusion in exit interviews. Pharmacists who asked about the nature of the study were told they would receive copies of the data collection forms after data collection was complete.

Throughout data collection, notes about the pharmacy and anecdotal information were recorded on a pad of paper. This information would be used to help interpret the results of this study.

Data Analysis

Data Coding

Data were coded for computer analysis. A copy of the coding format is in Appendix P. The Statistical Package for the Social Sciences/PC was used for conducting all statistical tests (Norusis 1988a, 1988b). Frequencies and descriptive statistics were calculated for each variable to help identify miscoded data and outliers. Also, they were used to describe the judgement samples used in this study to assess if there was sufficient variation in pharmacies and pharmacists. Descriptive statistics for prescription volume, Occurrence of Communication, and pharmacists' CRO were used to compare data for this study's judgement sample with statewide data collected in other studies.

Scale Reliability

Since only 23 pharmacists participated in this study, the reliability of CRO was accepted from results of the exploratory study in which the eight item measure was found reliable (Cronbach alpha = 0.71) from useable responses of 483 community pharmacists in Wisconsin. Other measures with three or more items were assessed for reliability using Cronbach's alpha. Cronbach alpha greater than 0.70 supported reliability of measures. Lack of Privacy was a two-item measure and assessed for reliability using Pearson correlation analysis. A correlation greater than 0.30 supported reliability of this measure.

If measures were found to have unacceptable reliability, items which were correlated the least with the other items in the scale were considered for deletion. Also, to help identify items for deletion, item to total scale correlations were calculated. Items which were correlated the least with the total scale were considered for deletion.

Scale Validity

Nomological validity was based on responses from research colleagues about the fit of the measures with their corresponding model (see Chapter II). Face

validity of the purified measures was assessed by a panel of research colleagues. Significant correlations between objective and subjective measures of a variable (i.e. > 0.30 for this study) were used to help support convergent validity.

Discriminant validity was assessed by computing a correlation matrix for independent variables used for Hypotheses H1 through H18. Nonsignificant correlations (i.e. < 0.30 for this study) between measures of theoretically unrelated variables were used to help support discriminant validity of measures.

Also, to help support discriminant validity of unrelated measures, an exploratory factor analysis was conducted. Only variables which were continuous variables, and for the most part, expected to be unrelated were included in the factor analysis (i.e. CRO, PRO, Lack of Time, Importance of Information, Lack of Privacy, and Satisfaction/Dissatisfaction with Pharmacist - Patient Communication). Varimax rotation was used for factor analysis to maintain orthogonality of factors and to minimize the number of variables that have high loadings on a factor. Only factors with eigenvalues greater than one were included in the factor solution. The desired factor solution would show six factors, each one representing one of the six variables. To support discriminant validity, items used to measure each variable should have a high factor loading (i.e. greater than or equal to 0.40) for the variable they measured and a low factor loading (i.e. < 0.40) for other variables.

Hypothesis Testing

Occurrence of Communication (H1 - H6)

Hypotheses H1 through H6 were tested using discriminant analysis. Discriminant analysis uses linear combinations of the independent variables for classifying cases into one of the two dependent variable groups (communication occurred or communication did not occur). To use this analysis it was assumed that each group is a sample from a multivariate normal population, and the population covariance matrices are equal (Norusis 1988a). Also, independent variables should not be highly correlated. Each independent variable was tested for significance at a level of 0.05.

To help test if assumptions were violated above tolerable levels, correlations among the independent variables were assessed for independence (i.e. correlations less than or equal to 0.30). Correlations greater than 0.30 but less than or equal to 0.60 were considered moderate; and those greater than or equal to 0.60 were considered severe. Also, distributions for each independent variable were reviewed to ascertain they were approximately normal. If independent variables did not have approximately normal distributions, transformations of these variables would be necessary. Dichotomous variables, such as Prescription Transfer, can be tolerated

in discriminant analysis.

To test only main effects proposed by hypotheses H1 through H6, the "direct variable selection method" was used for discriminant analysis (Norusis 1988a). By using this method, all six variables were entered into the analysis simultaneously as long as they satisfied tolerance criteria (p-value < 0.05). Wilk's lambda was used to determine which variables most significantly predicted Occurrence of Communication. Wilk's lambda is equal to the within-groups sum of squares to the total sum of squares. A lambda of 1 occurs when all observed group means are equal. Thus, large values of lambda (close to 1) indicate that group means do not appear to be different, while small values of lambda (close to 0) indicate that group means do appear to be different.

The univariate F-ratio and its significance level for each independent variable in the discriminant equation were used to test hypotheses H1 through H6. A significance level less than 0.05 implied the hypothesis was supported (i.e. corresponding null hypothesis rejected). Overall usefulness of the discriminant equation was assessed using the proportion of times the equation correctly predicted actual group membership. Another measure of how well the discriminant function predicted Occurrence of Communication was the canonical correlation. The canonical correlation is a measure of the degree of association between the discriminant scores and the groups.

Occurrence of Communication (Extended Investigation)

To perform the extended investigation about why communication between a pharmacist and patient may or may not occur, discriminant analysis was used as an exploratory tool in order to arrive at a good model for occurrence of communication between patients and pharmacists. If any of the independent variables were correlated highly with some of the other variables, it would be investigated as a possible mediating variable (i.e. variables exert their effects on Occurrence of Communication indirectly through the mediating variable). Multiple discriminant equations would be used to predict the occurrence of the mediating variable and Occurrence of Communication.

Another possible part of extended investigation was to investigate two-way interactive effects of independent variables which would suggest they are moderating variables. Significant two-way interactions suggest that the effect of one independent variable on Occurrence of Communication depends on the value of a second independent variable.

To investigate two-way interactive effects, two discriminant equations would be compared. The first equation would include significant main effects identified from hypothesis testing. The second equation would include those significant main effects and their two-way interactions. The equations would be compared using

Wilk's lambda and significance values for each variable.

Extended investigation for predicting Occurrence of Communication was exploratory in nature. Not all of the statistical tests mentioned previously necessarily were conducted because use of a certain test was determined by results of previously conducted tests. Rationale for the series of tests which were conducted are presented in the results section. Also, depending on findings from exploratory analysis, results of other statistical tests such as t-tests, chi-square tests, or correlation analysis may be presented in the results section to help interpret findings from the extended investigation.

Length and Content of Communication (H7 - H18)

Hypotheses H7 through H18 were tested using multiple regression analysis. For multiple regression analysis, the continuous dependent variable is a function of the independent variables. To use this analysis it was assumed that distributions of the dependent variable for levels of the independent variables were normal with constant variance. Also it was assumed that observations were independent, a linear relationship existed between the dependent and independent variables, and the random errors were independent with a normal distribution (Norusis 1988b).

Before testing hypotheses, violations of assumptions for regression analysis

were investigated. If violations were found, transformations of dependent or independent variables would be necessary to: linearize nonlinear functions, to achieve simple structure for estimates of the dependent variable, or create models with error terms satisfying the regression assumptions (Mendenhall and Sincich 1986).

To test the need for and usefulness of transformations, residual analysis was conducted. A residual is the difference between an observed value and the value predicted by the regression model. In regression analysis, the true errors are assumed to be independent normal values with a mean equal to zero and a constant variance. If the model is appropriate for the data, the observed residuals, which are estimates of the true errors, should have similar characteristics. Usually standardized residuals are used which should have a mean equal to zero and variance equal to one (Norusis 1988b).

If the model is appropriate for the data, there should be few outliers for standardized residuals (i.e. absolute value of standardized residual greater than three) and the distribution of residuals should be approximately normal. Another way to compare the observed distribution of residuals to that expected under the assumption of normality is to plot the two cumulative distributions against each other for a series of points. If the two distributions are identical, a straight line results. By observing how points scatter about the expected straight line, the two

distributions can be compared. This plot is called the Normal Probability Plot.

A means for judging how well a straight line fits the data is to plot the residuals against the predicted values. If the assumptions of linearity and homogeneity of variance are met, there should be no relationship between the predicted and residual values. This plot is called the Standardized Scatterplot.

After necessary transformations were made, multiple regression analysis was conducted to test hypotheses H7 through H18. Effects of independent variables on Length and Content of Communication for hypotheses H7 through H18 were tested at a significance level of 0.05. These hypotheses were tested preliminarily using all the cases and only cases for which communication occurred. This was done because cases for which no communication occurred had Length of Communication and Content of Communication values equal to zero, which would skew the respective dependent variables towards zero. By using only cases for which communication occurred, skewness of the dependent variables would be decreased. If different results were shown from the different analyses, hypotheses would be tested using only cases for which communication occurred.

Length and Content of Communication (Extended Investigation)

To perform the extended investigation for Length and Content of

Communication, regression analysis was used as an exploratory tool in order to arrive at a good model. If any of the independent variables were correlated highly with some of the other variables, it would be investigated as a possible mediating variable (i.e. variables exert their effects on Length or Content of Communication indirectly through the mediating variable). Multiple regression equations would be used to predict the occurrence of the mediating variable and Length or Content of Communication.

Another possible part of extended investigation was to investigate two-way interactive effects of independent variables which would suggest they are moderating variables. Significant two-way interactions suggest that the effect of one independent variable on Occurrence of Communication depends on the value of a second independent variable.

To investigate two-way interactive effects, two regression equations would be compared. The first equation would include significant main effects identified from hypothesis testing. The second equation would include those significant main effects and their two-way interactions. The equations would be compared using adjusted R-square values and significance values for each variable.

Extended investigations for predicting Length and Content of Communication were exploratory in nature. Not all of the statistical tests mentioned previously necessarily were conducted because use of a certain test was determined by results

of previously conducted tests. Rationale for the series of tests which were conducted are presented in the results section. Also, depending on findings from exploratory analysis, results of other statistical tests such as t-tests, chi-square tests, or correlation analysis may be presented in the results section to help interpret findings from the extended investigation.

Patients' Evaluation of Communication (H19)

Hypothesis H19 was tested using one-way analysis of variance. This hypothesis was tested using only data from respondents for whom communication occurred. If the overall F-statistic was found significant ($p < 0.05$), the Scheffe multiple comparison test was planned to determine which groups of respondents were significantly different from each other. In order to help understand and interpret findings from these tests, post hoc statistical analyses were conducted when deemed appropriate based on the results.

Other Data Analysis: Observation Effects

Since pharmacists knew they were being observed in this study, they may have behaved differently in the presence of the observer than when the observer was

absent. As mentioned previously, the researcher observed patterns of practice in each pharmacy anonymously before data collection began and compared them with patterns of practice during actual data collection. Also, to help decrease observation effects, a 10-15 minute "warm up" period was used to let pharmacists get used to being observed.

To help assure that precautions taken to minimize observation effects were useful, statistics were calculated to help investigate if observation effects were present. Comparisons were made between the group of the first 15 observations and the group of the other 15 observations at the 12 pharmacy sites. Using chi-square or t-test statistics comparisons between the two groups were made for Prescription Transfer, Occurrence of Communication, CRO, PRO, Lack of Time, Lack of Privacy, and Importance of Information. For cases when communication occurred, comparisons were made for Length and Content of Communication.

Similar comparisons were made for cases which comprised the first five observations involving a pharmacist compared with the last five observations involving a pharmacist. Only those pharmacists who were involved in at least 10 observations were included in this part of the analysis.

It was assumed that observation effects would be most prevalent during the earliest observations and then diminish. Therefore, if significant differences between groups were found for pharmacist behaviors such as Occurrence, Length, and

Content of Communication without corresponding differences in other variables, observation effects could be present.

Other Data Analysis: Comments

Comments provided by patients and pharmacists during their interviews were recorded. Comments were used in data analysis to help interpret the results.

V. RESULTS

Sample Description

Twelve pharmacies, located throughout Wisconsin, were used as data collection sites. Table 9 contains a summary of descriptive data for each pharmacy and shows that desired variations for variables used in this study were accomplished across pharmacies.

Average prescription volumes during data collection ranged from about 40 to 400 prescriptions between 10am and 6pm. This range was representative for the range of prescription volumes for Wisconsin pharmacies (based on comparison of data from Schommer and Wiederholt 1992a; and Schommer, et al. 1992).

The average Occurrence of Pharmacist - Patient Communication for the sample in this study (74 percent) was higher than the rate reported for Wisconsin by Wiederholt et al. (1992), (36 percent). The study by Wiederholt et al. was conducted almost 10 years before this study, which could be one reason for the difference. Also, patient's self-reports were used by Wiederholt et al. which, according to Ortiz et al. (1989), under-estimate rates of communication. Evidence of this was seen during patient interviews. After some patients were observed to receive communication from their pharmacist, they told the researcher during their interview that they didn't talk to their pharmacist about medications that visit. Patients seemed to disregard administrative information as communication. Also,

TABLE 9

DESCRIPTIONS OF TWELVE PHARMACIES INCLUDED IN THIS STUDY

(N = 360)

Pharmacy	RxVol	PRO	Time	New/Ref	%Trans	%Comm	Length	Content
1	40	40.5	9.1	3.1	100%	100%	72	4.2
2	50	39.9	6.0	2.7	100%	100%	108	4.3
3	65	37.5	3.5	3.2	77%	70%	12	2.0
4	70	39.7	5.5	2.3	90%	93%	46	2.5
5	75	39.2	7.5	3.4	100%	100%	82	5.2
6	80	40.0	7.2	3.3	97%	90%	51	3.0
7	90	38.3	6.4	2.7	57%	50%	15	1.8
8	110	36.3	8.0	3.5	90%	83%	22	2.5
9	180	38.1	9.4	3.2	77%	77%	19	2.1
10	200	34.9	7.4	2.9	57%	57%	8	1.5
11	210	31.3	13.7	2.7	30%	37%	6	0.9
12	400	37.3	14.1	3.1	3%	30%	16	1.1
Overall	131	37.9	8.1	3.0	73%	74%	38	2.6

RxVol = Approximate prescription volume between 10am and 6pm during data collection.
PRO = Average Patient Counselee Role Orientation score (higher score = more positive attitude towards pharmacist counseling).
Time = Average Lack of Time score (higher score = more time pressure).
New/Ref = Average score for item which coded new versus refill status of prescription dispensed (1 = renewal, and have been taking it for more than one year through 7 = more than one original prescription).
%Trans = Proportion of times the prescription was transferred to the patient by the pharmacist.
%Comm = Proportion of times pharmacist - patient communication occurred.
Length = Average length of communication (measured in seconds) per observation.
Content = Average number of types of content conveyed between pharmacist and patient per observation.

they often disregarded pharmacists' solicitation of feedback and any questions they asked the pharmacist as communication.

When administrative, solicitation of feedback, and patient question asking information were deleted as possible elements of communication, the Occurrence of Pharmacist - Patient Communication for this study dropped to 51 percent. This is closer to Wiederholt et al.'s finding. Differences in definition of Pharmacist - Patient Communication, time of the study, and methods of data collection probably account for most of the difference between Wiederholt et al.'s findings and those for this study.

Pharmacists, who participated in this study, reported higher Counselor Role Orientation (CRO) scores (average = 48) than a sample of 486 community pharmacists from Wisconsin (Schommer and Wiederholt 1992a), (average = 43). This shows one difference between the study sample and Wisconsin pharmacists overall, but the study sample was diverse enough to yield insight about Pharmacist - Patient Communication under different conditions of practice.

Thirty observations of pharmacist - patient interactions were completed at each of the 12 pharmacy sites for a total of 360 observations. All 360 patients who were observed were asked to participate in an interview as they left the pharmacy. Of these, 304 (84 percent) provided useable responses. Twenty-three pharmacists at the 12 pharmacy sites participated in this study. All 23 provided useable

responses to their interviews.

Measure Purification

Scale Reliability

Reliability scores for multi-item variables are presented in Table 10. For variables whose reliabilities were assessed by Cronbach's alpha, item-to-item correlation matrices are presented in Tables 11 through 15, and item-to-total scale correlations presented in Table 16. All of the variables assessed by Cronbach's alpha had adequate reliability (Cronbach's alpha > 0.70).

Table 10 shows the correlation coefficient for the two items used to measure Lack of Privacy was only 0.16. This did not meet the a priori requirement of a correlation coefficient greater than 0.30. Therefore, one item of this two-item measure needed to be omitted. One item was an objective measure based upon the number of people near the patient when the prescription was dispensed. The other item was a subjective measure of each patient's perception of the amount of privacy in the pharmacy when the prescription was dispensed. Since the subjective measure would incorporate many facets of what constitutes privacy for that patient, it was retained. The objective measure was omitted, yielding a one-item measure for Lack

TABLE 10
RELIABILITY SCORES FOR MULTI-ITEM VARIABLES

Variable	Reliability Score
CRO (8 items)	0.71 (a)
PRO (8 items)	0.76 (b)
Lack of Time (4 items)	0.81 (b)
Lack of Privacy (2 items)	0.16 (c)
Importance of Information (3 items)	0.71 (b)
Satisfaction/Dissatisfaction with Pharmacist - Patient Communication (3 items)	0.94 (b)

(a) Reliability assessed using data from 486 community pharmacists' responses to the statewide exploratory study.

(b) Reliability assessed using Cronbach's alpha

(c) Reliability assessed using Correlation Analysis

TABLE 11
CORRELATION MATRIX FOR ITEMS USED TO MEASURE PHARMACISTS' COUNSELOR ROLE ORIENTATION (a)

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8
Item1	1.00							
Item2	0.24	1.00						
Item3	0.15	0.39	1.00					
Item4	0.09	0.22	0.17	1.00				
Item5	0.22	0.22	0.14	0.10	1.00			
Item6	0.31	0.28	0.10	0.15	0.27	1.00		
Item7	0.31	0.23	0.19	0.11	0.28	0.59	1.00	
Item8	0.42	0.23	0.11	0.16	0.25	0.32	0.35	1.00

Item1 = The physician is better qualified than the pharmacist to advise patients about their medications.
Item2 = It takes too much time to counsel patients on the medication they receive.
Item3 = Most patients are more interested in receiving quick and inexpensive service from their pharmacist rather than advice.
Item4 = It is essential for the pharmacist to advise patients about potential side effects that their drugs may cause.
Item5 = An affixed prescription label and applicable auxiliary labels contain all the information about the prescribed drug that the patient should receive from the pharmacist.
Item6 = There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
Item7 = It is unethical to discuss with a patient the therapeutic purpose of his or her prescriptions.
Item8 = Patients receive the necessary information about their medications from their physician.

All items, except item4, were reverse coded.

(a) Reliability was assessed by Cronbach's alpha using data from 483 community pharmacists' useable responses to the statewide exploratory study.

TABLE 12
CORRELATION MATRIX FOR ITEMS USED TO MEASURE PATIENTS' COUNSELEE ROLE ORIENTATION (a)

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8
Item1	1.00							
Item2	0.08	1.00						
Item3	0.24	0.59	1.00					
Item4	0.11	0.38	0.36	1.00				
Item5	0.19	0.31	0.39	0.30	1.00			
Item6	0.18	0.33	0.29	0.16	0.23	1.00		
Item7	0.16	0.31	0.38	0.24	0.26	0.43	1.00	
Item8	0.35	0.26	0.36	0.15	0.38	0.29	0.23	1.00

Item1 = My physician is better qualified than the pharmacist to advise me about my medications.
Item2 = It takes too much time to talk with the pharmacist about the medication I receive.
Item3 = I am more interested in receiving quick an inexpensive service from the pharmacist rather than advice.
Item4 = It is essential for the pharmacist to advise me about potential side effects that my drugs may cause.
Item5 = An attached prescription label and other stickers put on the prescription bottle contain all the information about the prescribed drug that I should receive from the pharmacist.
Item6 = There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
Item7 = It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
Item8 = I receive the necessary information about my medications from my physician.

All items, except item4, were reverse coded.

(a) Reliability was assessed by Cronbach's alpha using 302 useable cases.

TABLE 13
CORRELATION MATRIX FOR ITEMS USED TO MEASURE
LACK OF TIME (a)

	Item1	Item2	Item3	Item4
Item1	1.00			
Item2	0.49	1.00		
Item3	0.61	0.65	1.00	
Item4	0.40	0.38	0.54	1.00

Item1 = Number of other patients (customers) waiting to approach the prescription counter.

Item2 = Number of interruptions outside the pharmacist - patient dyad that the pharmacist encountered while the patient is waiting for the prescription(s) to be dispensed.

Item3 = Perceived time pressure (pharmacist).

Item4 = Perceived time pressure (patient).

(a) Reliability was assessed by Cronbach's alpha using 303 useable cases.

TABLE 14
CORRELATION MATRIX FOR ITEMS USED TO MEASURE IMPORTANCE OF INFORMATION (a)

	Item1	Item2	Item3
Item1	1.00		
Item2	0.33	1.00	
Item3	0.34	0.70	1.00

Item1 = Patient's perceived importance of communicating with the pharmacist.

Item2 = Pharmacist's perceived importance of communication with the patient.

Item3 = Renewal status of dispensed prescription (if more than one prescription was dispensed, the prescription yielding the highest score was used).

(a) Reliability was assessed by Cronbach's alpha using 304 useable cases.

TABLE 15
CORRELATION MATRIX FOR ITEMS USED TO MEASURE SATISFACTION/DISSATISFACTION WITH COMMUNICATION (a)

	Item1	Item2	Item3
Item1	1.00		
Item2	0.93	1.00	
Item3	0.79	0.81	1.00

Item1 = How valuable do you rate the communication you had with your pharmacist today?

Item2 = How useful do you rate the communication you had with your pharmacist today?

Item3 = How satisfying do you rate the communication you had with your pharmacist today?

(a) Reliability was assessed by Cronbach's alpha using 233 useable cases.

TABLE 16
ITEM TO TOTAL SCALE CORRELATIONS FOR VARIABLES
WHOSE RELIABILITIES WERE ASSESSED BY CRONBACH'S ALPHA

Variable Name	Useful Observations for Reliability Calculation	Item Name	Correlation Coefficient
Counselor Role Orientation	N = 483 (from exploratory study)	ONE	.42
		TWO	.45
		THREE	.30
		FOUR	.24
		FIVE	.35
		SIX	.49
		SEVEN	.51
		EIGHT	.44
Patient Role Orientation	N = 302*		
		PRO1	.30
		PRO2	.53
		PRO3	.62
		PRO4	.38
		PRO5	.48
		PRO6	.43
		PRO7	.46
		PRO8	.47
Lack of Time	N = 303*		
		OTHERPT	.61
		INTERUPT	.61
		RPHTIME	.75
		PTTIME	.53
Importance of Information	N = 304*		
		PTIMPT	.36
		RPHIMPT	.62
		NEWREF	.61
Satisfaction/Dissatisfaction	N = 233*		
		VALUABLE	.90
		USEFUL	.92
		SATISFY	.81

* Ns vary due to missing data.

of Privacy.

Because of this change to a one-item measure, the "Lack of Privacy" measure was renamed "Patient Privacy" and a higher score now corresponded to a greater perceived privacy on the part of the patient. Therefore, hypothesized relationships between Patient Privacy and the dependent variables were expected to be positive rather than negative relationships as originally worded.

Scale Validity

Nomological and face validity of the measures were supported based upon responses of research colleagues. After Lack of Privacy was changed to the one-item Patient Privacy measure, two variables remained with objective and subjective measures: Lack of Time and Importance of Information. The correlation coefficient between the objective and subjective measures for Lack of Time was 0.67 and for Importance of Information was 0.61. These correlations exceed the a priori minimum set at 0.30, and support convergent validity between objective and subjective measures of the same variable.

Discriminant validity was assessed by computing a correlation matrix for independent variables for the primary goal of the study (see Table 17). Nonsignificant correlations (i.e. < 0.30 for this study) were found between

TABLE 17
CORRELATION MATRIX FOR INDEPENDENT VARIABLES
USED FOR HYPOTHESES H1 THROUGH H18
(N = 232)*

	CRO	PRO	Time	Priv	Impt	Rxtrans
CRO	-					
PRO	.18	-				
Time	-.15	-.04	-			
Priv	-.03	-.03	.10	-		
Impt	-.07	.17	.18	-.09	-	
Rxtrans	.48	.21	-.41	.18	.32	-

CRO = Counselor Role Orientation
PRO = Patient Role Orientation
Time = Lack of Time
Priv = Patient Privacy
Impt = Importance of Information
Rxtrans = Prescription Transfer

* N = 232 because of missing data for some of the variables, particularly for the satisfaction measure which was obtained only if communication occurred.

measures of theoretically nonrelated variables, except for Prescription Transfer. Discriminant validity was supported for all the variables except Prescription Transfer. Since Prescription Transfer was a dichotomous variable and none of its correlations with other variables were greater than 0.60, it still was included in discriminant analysis for hypothesis testing.

Also, to help support discriminant validity of unrelated measures, an exploratory factor analysis was conducted for items of selected variables. Results of the exploratory factor analysis are presented in Tables 18 and 19. Table 18 contains only factor loadings greater than or equal to 0.40, except for illustrative purposes. Table 19 contains all of the factor loadings. A six factor solution resulted, which corresponds with the six variables included in the analysis. Table 18 shows that 17 out of 20 items loaded on the expected factors. These results further support the discriminant validity of the measures used for this study.

Items PRO1 and PRO8 from the PRO measure did not load as well under Factor 2 (F2) as they did under Factor 5 (F5). Also, PTIMPT from the Importance of Information measure did not load as well under Factor 4 (F4) as it did under Factor 1 (F1). Even though these items did not load on factors as well as expected, they were not omitted because they contributed to the reliability of the measures and were consistent with the theory used for this study.

TABLE 18
EXPLORATORY FACTOR ANALYSIS TO SUPPORT DISCRIMINANT VALIDITY: *SELECTED FACTOR LOADINGS FOR ITEMS OF SELECTED VARIABLES
(N = 232)**

	F1	F2	F3	F4	F5	F6
PRO:						
PRO1		.11			.79	
PRO2		.75				
PRO3		.70				
PRO4		.46				.43
PRO5		.59				
PRO6		.65				
PRO7		.64				
PRO8		.35			.72	
Lack of Time:						
OTHERPT			.76			
INTERUPT			.75			
RPHTIME			.88			
PTTIME			.72			
CRO:						
CRO						.71
Patient Privacy:						
PTPRIV					.40	
Importance of Information:						
PTIMPT	.51			.19		
RPHIMPT				.91		
NEWREF				.88		
Satisfaction/Dissatisfaction with Pharmacist-Patient Communication:						
VALUABLE	.94					
USEFUL	.95					
SATISFY	.88					

* Loadings greater than or equal to 0.40 are listed except for illustrative purposes.
** N = 232 because of missing data for some of the variables.
Percentage of Variance Explained = 63.8%

TABLE 19
EXPLORATORY FACTOR ANALYSIS TO SUPPORT DISCRIMINANT VALIDITY: FACTOR LOADINGS FOR ITEMS OF SELECTED VARIABLES (N = 232)*

	F1	F2	F3	F4	F5	F6
PRO:						
PRO1	.12	.11	-.01	.04	.79	-.09
PRO2	.13	.75	-.14	-.13	-.04	.03
PRO3	.08	.70	-.07	.16	.21	.06
PRO4	.04	.46	.10	-.02	.01	.43
PRO5	.08	.59	.00	-.03	.26	.14
PRO6	.01	.65	-.02	.03	.11	-.21
PRO7	.06	.64	.06	.06	-.03	.18
PRO8	-.03	.35	-.04	-.03	.72	.02
Lack of Time:						
OTHERPT	.04	-.22	.76	.01	.08	-.11
INTERUPT	-.02	.05	.75	.10	-.09	-.11
RPHTIME	-.04	-.04	.88	.04	.00	-.11
PTTIME	.09	.08	.72	-.03	.02	.19
CRO:						
CRO	.12	.17	-.19	-.03	-.04	.71
Patient Privacy:						
PTPRIV	-.34	-.20	.15	.03	.40	.34
Importance of Information:						
PTIMPT	.51	.27	.18	.19	.12	-.28
RPHIMPT	.12	.01	-.01	.91	.02	.14
NEWREF	.08	.05	.13	.88	.00	-.19
Satisfaction/Dissatisfaction with Pharmacist-Patient Communication:						
VALUABLE	.94	.04	.02	.07	.03	.06
USEFUL	.95	.03	.04	.10	.06	.04
SATISFY	.88	.12	-.04	-.01	-.07	.16

* N = 232 because of missing data for some of the variables.
Percentage of Variance Explained = 63.8%

Hypothesis Testing

Occurrence of Communication

Relationships between independent variables and the Occurrence of Pharmacist - Patient Communication were proposed in hypotheses H1 through H6. Positive relationships were proposed for CRO, PRO, Patient Privacy (renamed after measure purification), Prescription Transfer, and Importance of Information with the Occurrence of Communication. A negative relationship was proposed between Lack of Time and Occurrence of Communication.

None of the continuous independent variables were correlated highly (i.e. > 0.30) and the distributions of each continuous independent variable were approximately normal. Therefore, the assumptions made for using discriminant analysis were not violated beyond tolerable levels.

Discriminant analysis, using the direct variable selection method, was used to test hypotheses H1 through H6. The results are presented in Table 20. For each of the six independent variables, means are given for the two groups under consideration (communication occurred versus communication did not occur). Differences between the groups are in the hypothesized direction for all six variables. Communication more likely occurred when a pharmacist transferred the

TABLE 20
DISCRIMINANT ANALYSIS RESULTS: HYPOTHESES H1 - H6
(N = 301)*

Variable	Group Means: Communication Occurred (N = 230)	Group Means: Communication Did not Occur (N = 71)	Wilk's Lambda	F-ratio	Significance
Prescription Transfer	0.93	0.14	0.41	430.7	.0000
Importance of Information	12.2	6.5	0.76	92.7	.0000
CRO	49.5	46.3	0.88	42.6	.0000
Lack of Time	7.4	10.2	0.93	22.1	.0000
PRO	38.7	35.4	0.94	17.5	.0000
Patient Privacy	4.9	4.3	0.97	9.3	.0024

Percent of "grouped" cases correctly classified by discriminant equation: 91.4 percent

* Total N = 301 due to missing data for some of the variables.

prescription to the patient, importance of information was higher, CRO was higher, more time was available (i.e. lower Lack of Time), PRO was higher, and Patient Privacy was higher.

According to values of Wilk's Lambda presented in Table 20, Prescription Transfer and Importance of Information are the variables whose means were most different for cases when communication occurred and cases when communication did not occur. Based on the univariate F-ratio and its significance level for each variable, all six variables were significant predictors for Occurrence of Pharmacist - Patient Communication with p-values less than 0.05. The resulting discriminant equation, using only main effects of the six variables, is:

Occurrence of Communication = -3.91 + 3.31(Prescription Transfer) + 0.11(Importance of Information) - 0.01(CRO) - 0.01(Lack of Time) + .01(PRO) + 0.04(Patient Privacy).

This equation correctly predicted the Occurrence of Pharmacist - Patient Communication for the study sample 91.4 percent of the time. Another measure of how well the discriminant function predicts Occurrence of Communication is called the canonical correlation. For this equation, the canonical correlation equaled 0.81. Wilk's lambda for the overall equation was 0.34 which suggests that the equation is useful for discriminating between the two groups in question.

The results show that each of the six independent variables significantly was related to the Occurrence of Pharmacist - Patient Communication in the

hypothesized direction. Therefore, hypotheses H1 through H6 were supported.

Extended Investigation for Occurrence of Communication

To learn more about why communication between a pharmacist and patient may or may not occur, an extended investigation was conducted. Table 20 shows that two main effects most significantly affected Occurrence of Communication: Prescription Transfer and Importance of Information. To help investigate the effects of Prescription Transfer and Importance of Information, Table 21 can be viewed as a simplified 2 x 2 x 2 contingency table showing rates of communication under different situations of Prescription Transfer and Importance of Information. For this table, Importance of Information was represented by whether the dispensed prescription was a new (original) or refill (renewal) prescription. This was done so categorization could be accomplished using an objective measure rather than pharmacists' or patients' subjective ratings. Table 21 shows that the overall rate of communication for new prescriptions was 92 percent compared to only 63 percent for refill prescriptions. For new prescriptions, when they were transferred to the patient by a pharmacist, communication occurred in virtually all the cases. When they were not transferred by a pharmacist, communication occurred in about only half of the cases. For refills, the effect is even more pronounced. When a

TABLE 21
OCCURRENCE OF COMMUNICATION UNDER CONDITIONS OF NEW VERSUS REFILL PRESCRIPTION DISPENSED AND WHETHER THE PRESCRIPTION WAS TRANSFERRED BY A PHARMACIST OR NOT
(N = 360)

NEW PRESCRIPTION		REFILL PRESCRIPTION	
Transferred by a Pharmacist (N = 113)	Not Transferred by a Pharmacist (N = 19)	Transferred by a Pharmacist (N = 150)	Not Transferred by a Pharmacist (N = 78)
99%	53%	91%	10%
Overall = 92%		Overall = 63%	

pharmacist transferred a refill prescription to a patient, communication occurred 91 percent of the time compared with only 10 percent of the time when a pharmacist did not transfer the prescription.

The relationship between Prescription Transfer and Occurrence of Communication was very strong. Using data presented in Table 21, when a pharmacist transferred the prescription to the patient, communication occurred in 94 percent of the cases (248/263). When a pharmacist did not transfer the prescription to the patient communication occurred in only 19 percent of the cases (18/97). In fact, there was a 91 percent correct prediction of whether or not communication occurred by whether or not Prescription Transfer occurred.

The strong relationship between Prescription Transfer and Occurrence of Communication, and significant correlations between Prescription Transfer and some of the other independent variables, suggest that Prescription Transfer may act as a mediating variable between CRO, PRO, Lack of Time, Patient Privacy, and Importance of Information with Occurrence of Communication. In order to better understand the role of Prescription Transfer in Occurrence of Pharmacist - Patient Communication, the effects of the other five independent variables on the occurrence of Prescription Transfer were investigated. Table 22 contains the results of a discriminant analysis testing the effects of these five independent variables.

For each of the significant independent variables, means are given for the two

TABLE 22

DISCRIMINANT ANALYSIS RESULTS: PREDICTION OF PRESCRIPTION TRANSFER (N = 302)*

Variable	Group Means: Transferred by a Pharmacist (N = 224)	Group Means: Not Transferred by a Pharmacist (N = 78)	Wilk's Lambda	F-ratio	Significance
CRO	49.8	45.6	0.77	89.3	.0000
Lack of Time	7.0	11.3	0.83	59.2	.0000
Importance of Information	11.8	8.1	0.90	34.3	.0000
PRO	38.7	35.8	0.95	14.5	.0002
Patient Privacy	4.9	4.3	0.97	9.7	.0020

Percent of "grouped" cases correctly classified by discriminant equation: 82.1 percent

* N = 302 due to missing data for some of the variables.

groups under consideration (Prescription was Transferred by a Pharmacist vs. Not Transferred by a Pharmacist). Prescription transfer by a pharmacist more likely occurred when CRO was higher, more time was available (i.e. lower Lack of Time), Importance of Information was higher, PRO was higher, and Patient Privacy was higher.

The discriminant equation using the five variables, listed in Table 22, correctly predicted the occurrence of Prescription Transfer 82.1 percent of the time. The results show that pharmacists' CRO, time pressures, and the importance of the information to convey to the patient were the most significant predictors of whether a pharmacist transferred a prescription to a patient or not. Since Prescription Transfer was identified as a mediating variable, two-way interactive effects of independent variables were not investigated.

In summary, the six hypotheses related to the Occurrence of Pharmacist - Patient Communication (H1 through H6) were supported. Communication more likely occurred when a pharmacist transferred the prescription to the patient, Importance of Information was higher, CRO was higher, more time was available (i.e. lower Lack of Time), PRO was higher, and Patient Privacy was higher. The strongest predictor for Occurrence of Communication was whether or not a pharmacist transferred the prescription to the patient followed by Importance of Information. When effects on Prescription Transfer were explored, pharmacists'

attitudes towards counseling patients, Lack of Time, and Importance of Information exerted the strongest effects.

Length of Communication

Relationships between independent variables and the Length of Pharmacist - Patient Communication were proposed in hypotheses H7 through H12. Positive relationships were proposed for CRO, PRO, Patient Privacy (renamed after measure purification), Prescription Transfer, and Importance of Information with the Length of Communication. A negative relationship was proposed between Lack of Time and the Length of Communication. Multiple regression analysis was used to test the effects of the independent variables on the Length of Pharmacist - Patient Communication.

Before testing hypotheses, violations of assumptions for regression analysis were investigated. Continuous independent variables had approximate normal distributions within tolerable deviations. None of the continuous independent variables were correlated with each other significantly (see Table 17). Therefore, multicollinearity was not a problem. It appeared that independent variables could be used in regression analysis without transformation.

Values for the dependent variable, Length of Communication, were not

normally distributed. Using all 360 cases, its mean was 38 seconds, with a standard deviation of 71 and a range from zero to 689. Relationships between Length of Communication and independent variables were not linear and appeared quadratic (as independent variables increased linearly, Length of Communication appeared to increase by its square). According to Ott (1984), possible transformations of the dependent variable (y) to linearize the data, with increasing severity of effects, are square root of y, log y, -1/y, and -1/y squared. According to Ott (1984) and Mirer (1988), the most appropriate transformations to linearize the data for this case were the square root transformation or natural log transformation of the dependent variable.

To test the usefulness of these transformations of the dependent variable, residual analysis was conducted for regression models using Length of Communication, square root of Length of Communication, and natural log of Length of Communication as dependent variables. Table 23 contains results for comparisons among regression equations using Length of Communication, square root of Length of Communication, and natural log of Length of Communication as dependent variables. Also, the adjusted R-square value is included in the table for each regression equation. Plots for the distribution of standardized residuals, normal probability plot, and standardized scatterplot for each regression equation are presented in Appendix Q. It should be noted that regression analysis was conducted

TABLE 23
COMPARISONS AMONG REGRESSION EQUATIONS FOR
TRANSFORMATIONS OF THE LENGTH OF COMMUNICATION

OVERALL (N = 360)

Comparison	Untransformed Variable	Square Root Transformation	Natural Log Transformation
Mean of SR*	-.002	-.001	.000
Standard Deviation of SR	.989	.988	.985
Number of SR Outliers	4	3	0
Normality of SR	normal	normal	bivariate
Normal Probability Plot	non-linear	linear	linear
Standardized Scatterplot	non-random (Poisson Distribution)	random	random
Adjusted R-square	.22	.44	.27

ONLY CASES FOR WHICH COMMUNICATION OCCURRED (N = 266)

Comparison	Untransformed Variable	Square Root Transformation	Natural Log Transformation
Mean of SR	.000	.000	.000
Standard Deviation of SR	.987	.987	.987
Number of Outliers for SR	4	3	0
Normality of SR	normal	normal	bivariate
Normal Probability Plot	non-linear	non-linear	linear
Standardized Scatterplot	non-random (Poisson Distribution)	random	random
Adjusted R-square	.17	.23	.27

* SR = standardized residuals

using all the cases (N = 360) and using only cases for which communication occurred (N = 266).

When all 360 cases were entered for analysis, problems were seen for the residual analysis when the untransformed dependent variable was used. It resulted in the most outliers, the normal probability plot was non-linear, and the standardized scatterplot had a non-random distribution. In fact, the distribution appeared to be a Poisson distribution (see Mendenhall and Sincich, 1986, pages 252-255). According to Mendenhall and Sincich (1986), the appropriate stabilizing transformation for the Poisson distribution is the square root transformation of the dependent variable.

Residual analysis for the square root transformation showed improvement for the residual analysis tests. Also, the adjusted R-square improved to 0.44 because residuals were smaller for this transformation. Residual analysis for the natural log transformation showed improved results for the Normal Probability Plot, but the distribution of the standardized residuals no longer appeared normal. Therefore the square root transformation appeared to be the best transformation for this part of analysis.

Similar results were found for comparisons among the regression equations when only cases for which communication occurred were used (N = 266). Thus, the square root transformation was used for hypothesis testing for these data.

In summary, assumptions for regression analysis were violated when Length of Communication was used as the dependent variable. The appropriate transformation to linearize the data and improve results of residual analysis was the square root transformation of Length of Communication. Hypotheses H7 through H12 were tested using multiple regression analysis with the square root of Length of Communication as the dependent variable. These hypotheses were tested preliminarily using all the cases (N = 360) and only cases for which communication occurred (N = 266). This was done because cases for which no communication occurred had Length of Communication values equal to zero, which exacerbated the skewness of the dependent variable. By using only cases for which communication occurred, skewness of the dependent variable was decreased.

Table 24 contains results of multiple regression analysis for effects of independent variables on the square root of Length of Pharmacist - Patient Communication. When all of the data were included, significant independent variables were Importance of Information, Prescription Transfer, Patient Role Orientation, and Lack of Time (p-values < 0.05). The first three variables affected the Length of Communication in the hypothesized direction, but the effect of Lack of Time was in the opposite direction than hypothesized. Adjusted R-square for the regression equation was 0.44. The effects of Counselor Role Orientation and Patient Privacy were not significant.

TABLE 24
MULTIPLE REGRESSION ANALYSIS RESULTS:
EFFECTS OF INDEPENDENT VARIABLES ON
LENGTH OF PHARMACIST - PATIENT COMMUNICATION
(Square root transformation of dependent variable)

OVERALL (N = 360)

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.33	.38	8.0	.0000
Prescription Transfer	3.54	.35	6.3	.0000
Patient Role Orientation	.16	.22	4.7	.0000
Lack of Time	.13	.13	2.7	.0072
Counselor Role Orientation	.01	.01	.16	.8729
Patient Privacy	.02	.01	.14	.8928

Adjusted R-square = 0.44

ONLY CASES FOR WHICH COMMUNICATION OCCURRED (N = 266)

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.28	.33	5.4	.0000
Patient Role Orientation	.18	.27	4.5	.0000
Lack of Time	.15	.16	2.5	.0122
Prescription Transfer	1.21	.08	1.2	.2324
Patient Privacy	-.06	-.02	-0.4	.6784
Counselor Role Orientation	.00	.00	0.0	.9872

Adjusted R-square = 0.23

When just the data for cases in which communication occurred were used, Prescription Transfer no longer was significant. This suggests that the effect of Prescription Transfer primarily helped predict dependent variable scores equal to zero. This is consistent with the finding from an earlier section in which Prescription Transfer best predicted whether communication occurred or not (i.e. Length of Communication greater than zero versus equal to zero). To account for this effect, final hypothesis testing was conducted only using cases for which communication occurred. Thus, only hypotheses H8 and H12 were supported: there were positive relationships for Importance of Information and Patient Role Orientation with Length of Pharmacist - Patient Communication. Hypotheses H7, H9, H10, and H11 were not supported. Not only was hypothesis H9 not supported, but was significant in the opposite direction hypothesized. Therefore, CRO, Lack of Time, Patient Privacy, and Prescription Transfer did not affect Length of Communication as hypothesized.

Extended Investigation for Length of Communication

To learn more about what affects the Length of Pharmacist - Patient Communication, two-way interactive effects were investigated in addition to the main effects of the six independent variables. The goal of this portion of data

analysis was to develop the best predictive equation for Length of Communication. Consistent with methods used for hypothesis testing, the square root transformation of the dependent variable was used. Also, based on earlier arguments, only cases for which communication occurred were included (N = 266).

Two multiple regression functions were developed and compared to find the "best" predictive equation. Only main effects of the independent variables, whose hypothesized relationships were supported (i.e. Importance of Information and PRO), were included for the first equation. The second equation included the main effects and two-way interactions for these independent variables.

Table 25 contains results from regression analysis for Importance of Information, PRO, and their interaction. Using just main effects, adjusted R-square was 0.22 and both Importance of Information and PRO were significant (p-values < 0.05). When the interaction term was included, the adjusted R-square did not change and none of the variables were significant.

Based on these results, the first equation which included just the main effects for Importance of Information and PRO was the best predictor for Length of Communication. Although Prescription Transfer was correlated with some of the independent variables, it was not tested as a mediating variable because its main effect was not significant for predicting Length of Communication when only cases for which communication occurred were used.

TABLE 25
MULTIPLE REGRESSION ANALYSIS RESULTS:
EXTENDED INVESTIGATION FOR EFFECTS OF
INDEPENDENT VARIABLES ON LENGTH OF
PHARMACIST - PATIENT COMMUNICATION
(Square root transformation of dependent variable)
(N = 266)

MAIN EFFECTS

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.29	.34	5.8	.0000
Patient Role Orientation	.18	.27	4.6	.0000

Adjusted R-square = 0.22

MAIN EFFECTS AND TWO-WAY INTERACTIVE EFFECTS

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Patient Role Orientation	.10	.14	1.0	.3321
Importance of Information	.01	.01	0.0	.9747
Patient Role Orientation by Importance of Information	.01	.38	1.0	.3325

Adjusted R-square = 0.22

To help understand and interpret these results, the effect of PRO on Length of Communication was thought to be mediated by patient question asking behaviors. Patients who asked a question had significantly higher PROs than those who did not ask a question (p-value = 0.02). And, when a patient asked a question, the average Length of Communication was 95 seconds compared to only 27 seconds when a patient did not ask a question (p-value = 0.000). The overall average Length of Communication was 52 seconds for cases in which communication occurred.

In summary, hypotheses H8 and H12 were supported: communication more likely was longer when Importance of Information was higher, and PRO was higher. One of the variables, Lack of Time, was a significant predictor for Length of Communication in the opposite direction hypothesized. Less time for communication (higher Lack of Time) resulted in longer communications, on average. The "best" predictive regression equation showed that the main effects of Importance of Information and PRO were most useful for predicting Length of Pharmacist - Patient Communication. The effect of PRO on Length of Communication may be mediated by an increased likelihood of question asking by patients with higher PROs.

Content of Communication

Relationships between independent variables and Content of Pharmacist - Patient Communication were proposed in hypotheses H13 through H18. Positive relationships were proposed for CRO, PRO, Patient Privacy (renamed after measure purification), Prescription Transfer, and Importance of Information with the Content of Communication. A negative relationship was proposed between Lack of Time and Content of Communication. Multiple regression analysis was used to test the effects of the independent variables on the Content of Pharmacist - Patient Communication.

Before testing hypotheses, violations of assumptions for regression analysis were investigated. Continuous independent variables had approximate normal distributions within tolerable deviations. None of the continuous independent variables were correlated with each other significantly. It appeared that independent variables could be used in regression analysis without transformation.

Values for the dependent variable, Content of Communication, were not normally distributed. Using all 360 cases, its mean was 2.6, with a standard deviation of 2.5 and a range from zero to 12. Relationships between Content of Communication and independent variables were not linear. According to Ott (1984) and Mirer (1988), the most appropriate transformations to linearize the data for this case were the square root transformation or natural log transformation of the

dependent variable.

Table 26 contains results for the comparisons among regression equations using Content of Communication, square root of Content of Communication, and natural log of Content of Communication as dependent variables. Also, the adjusted R-square value is included in the table for each regression equation. Plots for the distribution of standardized residuals, normal probability plot, and standardized scatterplot for each regression equation are presented in Appendix Q. It should be noted that regression analysis was conducted using all the cases (N = 360) and using only cases for which communication occurred (N = 266).

When all 360 cases were entered for analysis, problems were seen for the residual analysis when the untransformed dependent variable was used. It resulted in the most outliers, the normal probability plot was non-linear, and the standardized scatterplot had a non-random distribution. In fact, the distribution appeared to be a Poisson distribution (see Mendenhall and Sincich, 1986, pages 252-255). According to Mendenhall and Sincich (1986), the appropriate stabilizing transformation for the Poisson distribution is the square root transformation of the dependent variable.

Residual analysis for the square root transformation showed improvement for the residual analysis tests. Also, the adjusted R-square improved to 0.63 because residuals were smaller for this transformation. Residual analysis for the natural log

TABLE 26
COMPARISONS AMONG REGRESSION EQUATIONS FOR
TRANSFORMATIONS OF THE CONTENT OF COMMUNICATION

OVERALL (N = 360)

Comparison	Untransformed Variable	Square Root Transformation	Natural Log Transformation
Mean of SR*	.000	.000	.000
Standard Deviation of SR	.999	.990	.987
Number of SR Outliers	6	0	0
Normality of SR	normal	normal	multiple peaks
Normal Probability Plot	non-linear	linear	linear
Standardized Scatterplot	non-random (Poisson Distribution)	random	random
Adjusted R-square	.48	.63	.30

ONLY CASES FOR WHICH COMMUNICATION OCCURRED (N = 266)

Comparison	Untransformed Variable	Square Root Transformation	Natural Log Transformation
Mean of SR	.000	.000	.000
Standard Deviation of SR	.987	.987	.987
Number of Outliers for SR	3	0	0
Normality of SR	normal	normal	multiple peaks
Normal Probability Plot	linear	linear	linear
Standardized Scatterplot	non-random (Poisson Distribution)	random	random
Adjusted R-square	.28	.30	.30

* SR = standardized residuals

transformation showed multiple peaks for the distribution of standardized residuals and a low adjusted R-square. Therefore, the square root transformation was chosen for use in this part of analysis.

Similar results were found for comparisons among the regression equations when only cases for which communication occurred were used (N = 266). Adjusted R-square was improved for both the square root and natural log transformations. However, the distribution of standardized residuals was not normally distributed for the natural log transformation. Thus, the square root transformation was used in hypothesis testing for these data.

In summary, assumptions for regression analysis were violated when Content of Communication was used as the dependent variable. The appropriate transformation to linearize the data and improve results of residual analysis was the square root transformation of Content of Communication. Hypotheses H13 through H18 were tested using multiple regression analysis with the square root of Content of Communication as the dependent variable. These hypotheses were tested preliminarily using all the cases (N = 360) and only cases for which communication occurred (N = 266). This was done because cases for which no communication occurred had Content of Communication values equal to zero, which exacerbated the skewness of the dependent variable. By using only cases for which communication occurred, skewness of the dependent variable was decreased.

Table 27 contains results of multiple regression analysis for effects of the six independent variables on the square root of Content of Pharmacist - Patient Communication. When all of the data were included, significant independent variables were Prescription Transfer, Importance of Information, and Patient Role Orientation (p-values < 0.05). These variables affected the content of communication in the hypothesized direction. Adjusted R-square for the regression equation was 0.63. The effects of Counselor Role Orientation, Lack of Time, and Patient Privacy were not significant.

When just the data for cases in which communication occurred were used, Prescription Transfer no longer was significant. This suggests that the effect of Prescription Transfer primarily helped predict dependent variable scores equal to zero. This is consistent with the finding from an earlier section in which Prescription Transfer best predicted when communication did or did not occur (i.e. content of communication greater than zero versus equal to zero). To account for this effect, final hypothesis testing was conducted only using cases for which communication occurred. Thus, hypotheses H14 and H18 were supported: there were positive relationships for Importance of Information and Patient Role Orientation with Content of Pharmacist - Patient Communication. Hypotheses H13, H15, H16, and H17 were not supported. Therefore, CRO, Lack of Time, Patient Privacy, and Prescription Transfer did not affect Content of Communication as

TABLE 27
MULTIPLE REGRESSION ANALYSIS RESULTS:
EFFECTS OF INDEPENDENT VARIABLES ON
CONTENT OF PHARMACIST - PATIENT COMMUNICATION
(Square root transformation of dependent variable)

OVERALL (N = 360)

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.08	.46	11.8	.0000
Prescription Transfer	1.09	.52	11.5	.0000
Patient Role Orientation	.02	.10	2.8	.0062
Counselor Role Orientation	-.01	-.06	-1.4	.1733
Lack of Time	.01	.04	1.1	.2716
Patient Privacy	.01	.01	0.3	.7854

Adjusted R-square = 0.63

ONLY CASES FOR WHICH COMMUNICATION OCCURRED (N = 266)

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.06	.49	8.4	.0000
Patient Role Orientation	.02	.16	2.8	.0049
Prescription Transfer	.28	.12	2.0	.0517
Counselor Role Orientation	-.02	-.10	-1.7	.0964
Lack of Time	.01	.07	1.1	.2644
Patient Privacy	-.01	-.04	-0.6	.5181

Adjusted R-square = 0.30

hypothesized.

Extended Investigation for Content of Communication

To learn more about what affects Content of Pharmacist - Patient Communication, two-way interactive effects were investigated in addition to the main effects of the six independent variables. The goal of this portion of data analysis was to develop the best predictive equation for Content of Communication. Consistent with methods used for hypothesis testing, the square root transformation of the dependent variable was used. Also, based on earlier arguments, only cases for which communication occurred were included (N = 266).

Two multiple regression functions were developed and compared to find the "best" predictive equation. Only main effects of the independent variables, whose hypothesized relationships were supported (i.e. Importance of Information and PRO), were included for the first equation. The second equation included the main effects and two-way interactions for these independent variables.

Table 28 contains results from regression analysis for Importance of Information, PRO, and their interaction. Using just main effects, adjusted R-square was 0.29 and both Importance of Information and PRO were significant (p-values < 0.05). When the interaction term was included, the adjusted R-square did not

TABLE 28
MULTIPLE REGRESSION ANALYSIS RESULTS:
EXTENDED INVESTIGATION FOR EFFECTS OF
INDEPENDENT VARIABLES ON CONTENT OF
PHARMACIST - PATIENT COMMUNICATION
(Square root transformation of dependent variable)
(N = 266)

MAIN EFFECTS

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Importance of Information	.06	.49	8.7	.0000
Patient Role Orientation	.02	.16	2.8	.0052

Adjusted R-square = 0.29

MAIN EFFECTS AND TWO-WAY INTERACTIVE EFFECTS

Variable	Beta Coefficient	Standardized Coefficient	T-ratio	Significance
Patient Role Orientation by Importance of Information	.00	.48	1.3	.2048
Importance of Information	.01	.08	0.2	.8187
Patient Role Orientation	.00	.00	0.0	.9806

Adjusted R-square = 0.29

change and none of the variables were significant.

Based on these results, the first equation which included just the main effects for Importance of Information and PRO was the best predictor for Content of Communication. Although Prescription Transfer was correlated with some of the independent variables, it was not tested as a mediating variable because its main effect was not significant for predicting Content of Communication when only cases for which communication occurred were used.

To help understand and interpret these results, the effect of PRO on Content of Communication was thought to be mediated by patient question asking behaviors. Patients who asked a question had significantly higher PROs than those who did not ask a question (p-value = 0.02). And, when a patient asked a question, the average Content of Communication was 4.9 types of information compared to only 2.7 when a patient did not ask a question (p-value = 0.000). The overall average Content of Communication was 3.5 types of information.

Importance of Information, the other significant variable, not only affected the amount of Content of Communication, but also what types of information were conveyed. Table 29 contains comparisons of the proportion of times certain types of information were conveyed under situations when the prescription was new (original) versus refill (renewal). The new versus refill distinction was used because it was the objective measure for Importance of Information and was useful for

TABLE 29
PROPORTION OF TIMES TYPES OF INFORMATION
WERE CONVEYED UNDER SITUATIONS FOR
NEW VERSUS REFILL PRESCRIPTIONS
(N = 266)*

Type of Information	New (N=122)	Refill (N=144)	Overall (N=266)	p-value
Directions for Use	86%	24%	52%	.0000 **
Administrative	41%	57%	50%	.0114 **
Solicitation of Feedback	39%	57%	49%	.0051 **
Purpose of Medication	74%	16%	43%	.0000 **
Patient Question Asking	43%	31%	36%	.0611
Side Effects	60%	12%	34%	.0000 **
Name of Medication	56%	16%	34%	.0000 **
Monitoring	17%	20%	19%	.6323
Continuity of Therapy	11%	14%	12%	.5276
Interactions	10%	3%	6%	.0324 **
Contraindications	7%	0%	3%	.0030 **

* Only cases for which communication occurred were included in data analysis.

** Two-tailed t-test significant at p-value less than 0.05

categorization purposes. Consistent with arguments made before, only data from cases for which communication occurred (N = 266) were used.

Table 29 shows that, for new prescriptions, patients significantly more often received information about the name, purpose, directions, side effects, interactions, and contraindications for the medication. The most common types of information conveyed for new prescriptions were directions for use (86 percent) and purpose of medication (74 percent). For refill prescriptions, patients significantly more often received administrative and solicitation of feedback types of information. These also were the most common types of information given for refills (each were provided 57 percent of the time).

In summary, hypotheses H14 and H18 were supported: More types of communication were conveyed when Importance of Information was higher, and PRO was higher. The "best" predictive regression equation showed that the main effects of Importance of Information and PRO were most useful for predicting Content of Pharmacist - Patient Communication. The effect of PRO on Content of Communication may be mediated by an increased likelihood of question asking by patients with higher PROs. Differences in types of information conveyed were found depending on whether the dispensed prescription was new or a refill (an objective measure of Importance of Information).

Patients' Evaluation of Communication

The direct effect of Confirmation/Disconfirmation of Expectations on patients' Satisfaction/Dissatisfaction with Pharmacist - Patient Communication was explored (see Figure 3). Differences in Satisfaction scores among the three groups of respondents are presented in Table 30. Respondents who reported Negatively Disconfirmed Expectations had an average Satisfaction score equal to 11.8, compared with scores of 17.4 and 19.3 for respondents who reported Confirmed or Positively Disconfirmed Expectations, respectively. One-way Analysis of Variance showed these differences were significant. ($p = 0.000$). Satisfaction scores for the Negative Disconfirmation and Confirmation groups ranged from 3 to 21. In contrast, none of the Satisfaction scores for the Positive Disconfirmation group were below 11.

There were two problems with this analysis, however. The standard deviation for the "Negative Disconfirmation" group was over twice the other groups'. Also, only five respondents comprised this group. Therefore, the results from this analysis are suspect even though they are in support of the hypothesized relationship between Confirmation/Disconfirmation of Expectations and Satisfaction/Dissatisfaction.

Because of these problems, respondents who comprised the Negative Disconfirmation group were omitted from data analysis and a t-test was performed

TABLE 30
MEAN SATISFACTION SCORES* FOR RESPONDENTS CATEGORIZED AS HAVING NEGATIVE DISCONFIRMATION, CONFIRMATION, OR POSITIVE DISCONFIRMATION OF EXPECTATIONS**
(N = 203)***

	Negative Disconfirmation (N = 5)	Confirmation (N = 141)	Positive Disconfirmation (N = 57)
Mean	11.8	17.7	19.3
Standard Deviation	8.8	3.5	2.6
Range	3-21	3-21	11-21

One Way Analysis of Variance F-ratio = 12.5, p = 0.000

* SATISFACTION SCORES = sum of three-item measure of Satisfaction/ Dissatisfaction with Pharmacist - Patient Communication; possible range = 3 through 21.

** NEGATIVE DISCONFIRMATION = expectations for pharmacist - patient communication exceeded performance
CONFIRMATION = expectations for pharmacist - patient communication matched performance
POSITIVE DISCONFIRMATION = performance for pharmacist - patient communication exceeded expectations

*** Overall N = 203 because data were collected for these variables only when communication occurred and due to missing data.

to test if satisfaction scores between the remaining two groups were significantly different. The results are presented in Table 31 and show that satisfaction scores were significantly different ($p = 0.002$) between respondents who reportedly received what they expected (17.4) compared to more than they expected (19.3). The highest score for both groups was 21, but the lowest score was 3 for the Confirmation group compared with 11 for the Positive Disconfirmation Group.

Results from extended data analysis showed that respondents who reportedly received more communication from their pharmacist than expected (Positive Disconfirmation) had significantly longer communications (mean = 75 seconds) and more content conveyed (mean = six types of information) than respondents who received what they expected (average length = 32 seconds and an average of two types of information conveyed).

In summary, hypothesis H19 was supported. Patients who reportedly have their expectations for communication exceeded, report the highest satisfaction with the service. Longer communications, with more types of information conveyed, lead to positive disconfirmation of patients' expectations for Pharmacist - Patient Communication. Only a small proportion of patients did not have their expectations for communication with a pharmacist met or exceeded.

TABLE 31
MEAN SATISFACTION SCORES* FOR RESPONDENTS CATEGORIZED AS HAVING CONFIRMATION OR POSITIVE DISCONFIRMATION OF EXPECTATIONS**
(N = 197)***

	Confirmation (N =141)	Positive Disconfirmation (N = 57)
Mean	17.7	19.3
Standard Deviation	3.5	2.6
Range	3-21	11-21

t-ratio = -3.13, p = 0.002

* SATISFACTION SCORES = sum of three-item measure of Satisfaction/ Dissatisfaction with Pharmacist - Patient Communication; possible range = 3 through 21.

** CONFIRMATION = expectations for pharmacist - patient communication matched performance
POSITIVE DISCONFIRMATION = performance for pharmacist - patient communication exceeded expectations

*** Overall N = 197 because data were collected for these variables only when communication occurred and due to missing data.

Observation Effects

To help assure that precautions taken to minimize observation effects were useful, comparisons were made between the first 15 observations and the other 15 observations at the 12 pharmacy sites. Table 32 contains results of these comparisons. Occurrence, Length, and Content of Communication were not significantly different between the two groups. The only variable which was different was PRO: patients who comprised the first 15 observations reported significantly lower PRO's than other patients. Since this variable is not related to pharmacists, observation effects probably were not the cause for the difference.

Table 33 contains results of comparisons between the first five observations and last five observations for pharmacists who were involved in at least 10 observations overall. None of the variables presented in Table 33 were significantly different between the two groups.

Selected Respondent Comments

Some patients and pharmacists provided comments during their interviews. Selected respondent comments are presented in Appendix R. Most of the comments were favorable. Some patients chose to patronize a particular pharmacy because of

TABLE 32
COMPARISONS BETWEEN FIRST 15 OBSERVATIONS AND THE OTHER 15 OBSERVATIONS AT PHARMACY SITES
(N = 360)

Variable	First 15 Observations (N = 180)	Other 15 Observations (N = 180)	p-value
Occurrence of Communication	74%	73%	.90
Prescription Transfer	73%	73%	1.00
Counselor Role Orientation	48.7	48.6	.88
Patient Role Orientation	37.0	38.8	.01
Lack of Time	8.4	7.8	.28
Patient Privacy	4.8	4.8	.88
Importance of Information	10.5	11.2	.28
	(N = 134)*	(N = 132)*	
Length of Communication	81.4	74.5	.35
Content of Communication	3.5	3.5	.99

* Only includes cases for which communication occurred

TABLE 33
COMPARISONS BETWEEN FIRST FIVE OBSERVATIONS AND LAST FIVE OBSERVATIONS FOR PHARMACISTS WHO WERE INVOLVED IN AT LEAST TEN OBSERVATIONS
(N = 130)

Variable	First Five Observations (N = 65)	Last Five Observations (N = 65)	p-value
Occurrence of Communication	71%	69%	.85
Prescription Transfer	69%	71%	.85
Counselor Role Orientation	48.9	48.9	1.00
Patient Role Orientation	36.1	38.2	.07
Lack of Time	8.2	7.8	.64
Patient Privacy	5.1	4.7	.25
Importance of Information	9.8	10.4	.56
	(N = 46)*	(N = 45)*	
Length of Communication	67.4	36.0	.08
Content of Communication	3.5	3.2	.61

* Only includes cases for which communication occurred

the communication they can have with their pharmacist. One respondent commented that she was going through cancer treatment and relied on her pharmacist more than her physician because the pharmacist is more accessible. Patients' satisfaction with their pharmacist and the trust they place in him or her was evident by the comments.

During one patient interview, a patient asked, "Is the girl I talked with a pharmacist?" The girl was not a pharmacist, but may have been viewed as one at this pharmacy because the pharmacists often were hidden behind a high prescription counter. Some patients commented they wanted to receive more information about side effects. One patient had problems with coughing caused by a blood pressure medication, which progressed to the point that she was coughing up blood. This drug misadventure could have been avoided if she had received information from her pharmacist about how to monitor for and deal with this side effect. Another respondent commented that a pharmacist once refused to give her a package insert for Proventil inhaler, so she changed pharmacies.

Six of the 23 participating pharmacists provided comments during their interview. Some pharmacists commented that communicating with patients is extremely patient specific and involves a complex decision process. They "gear the information to the specific patient."

VI. DISCUSSION

Interactions between 360 patients and 23 pharmacists in 12 pharmacies were used to accomplish two research goals. The primary goal was to identify variables which affect Pharmacist - Patient Communication and test their effects in community pharmacy practice. Based on a Model of Pharmacist - Patient Communication, relationships among CRO, PRO, Lack of Time, Patient Privacy, Prescription Transfer, and Importance of Information with the Occurrence, Length, and Content of Pharmacist - Patient Communication were investigated.

The secondary goal was to explore patients' evaluation of Pharmacist - Patient Communication. Based on a Model of Service Encounter Evaluation, the relationship between patient's expectations for and satisfaction with Pharmacist - Patient Communication was explored.

The results are discussed in three parts. The first two parts correspond to the primary goal of the study and the third part corresponds with the secondary goal of the study. First, findings for variables related to the Occurrence of Pharmacist - Patient Communication are discussed. Second, findings for variables related to the Length and Content of Pharmacist - Patient Communication are discussed. Finally, findings for patients' evaluations of Pharmacist - Patient Communication (i.e. Satisfaction) are discussed. After results are discussed, implications for future research, implications for pharmacy practice, and study limitations are presented.

Occurrence of Communication

All six variables identified through the literature review and exploratory study (Prescription Transfer, Importance of Information, CRO, Lack of Time, PRO, and Patient Privacy) significantly were related to Occurrence of Pharmacist - Patient Communication. Communication more likely occurred when a pharmacist transferred the prescription to the patient, Importance of Information was higher, CRO was higher, more time was available (i.e. lower Lack of Time), PRO was higher, and Patient Privacy was higher. Some of these results are consistent with previous research conducted on this topic and suggest that roles of pharmacists, patients, and contextual cues are important for Occurrence of Communication.

Mason (1979) first investigated the effects of CRO on Pharmacist - Patient Communication and reported a positive relationship between them. Results from the present study support Mason's findings. However, CRO was not the most significant predictor for Occurrence of Communication.

Some researchers (including those who conducted the exploratory work for this study) used pharmacists' self-reports to investigate what variables most significantly affect Occurrence of Communication. Pharmacists most often reported Lack of Time, Patient Privacy, and patients' motivation for counseling (measured by PRO in this study) to affect Occurrence of Communication. The results of this study support some of the findings of the self-report studies. Although these

variables were found significant in this study, other variables had a stronger relationship with Occurrence of Communication. It appears that when communication with a patient is deemed important by a pharmacist, time and privacy barriers to communication can be overcome.

There were two variables which most significantly affected Occurrence of Communication in this study: Prescription Transfer and Importance of Information. This finding is one of the most significant contributions of the study. Few published studies were found in which Prescription Transfer was used to predict Pharmacist - Patient Communication (e.g. Svarstad, et al. 1979). And few published studies were found in which Importance of Information was used to predict Occurrence of Pharmacist - Patient Communication [e.g. type of drug dispensed (Kirking 1980) and new versus refill status (Wiederholt et al. 1992)]. Future research on the occurrence of communication between pharmacists and patients should include Prescription Transfer and Importance of Information as predictive variables.

Results presented in Table 20 showed that Importance of Information was rated almost twice as high for cases in which communication occurred as for cases when communication did not occur. Pharmacists appear to make subjective decisions about providing communication to patients based on the patient's experience with the medication. Importance of Information was rated low for prescriptions which were refills and taken by the patient for a long period of time. New prescriptions

with which the patient likely was unfamiliar were rated high in Importance of Information (see Table 14).

Patients used the new versus refill dichotomy for judging Importance of Information as well (see Table 14). Some commented that since the prescription they received that day was a refill, they didn't need to talk with their pharmacist. However, patients also may use their experiences since the last time they saw their pharmacist for judging Importance of Information. For example, a patient may experience a side effect months after he or she began taking the prescription (e.g. gastrointestinal pain months after starting a nonsteroidal anti-inflammatory agent, which may signify stomach ulceration caused by the drug). In cases like this, patients may judge Importance of Information higher because they need to consult with their pharmacist. Importance of Information probably is a better variable to use for predicting Occurrence of Communication than just using the new versus refill dichotomy because it includes pharmacists' and patients' judgements about how important communication would be for a specific situation.

As mentioned before, the most important variable for predicting Occurrence of Communication was Prescription Transfer. There was a strong correlation between occurrence of Prescription Transfer and Occurrence of Communication. Prescription Transfer could be a behavior targeted for change in order to improve Occurrence of Pharmacist - Patient Communication. Peter and Olson (1990)

suggested A Consumer Behavior Management Model for identifying interventions to help increase the probability of desired behaviors, such as Occurrence of Communication. They proposed that the problem behavior for targeting interventions should be the "earliest behavior in the sequence that is not being performed - or is not being performed appropriately or frequently enough to lead to the next behavior." Therefore, the best interventions for improving Pharmacist - Patient Communication may be the ones targeted to change Prescription Transfer behaviors.

In Wisconsin, a regulation already is in place that states, "Only licensed pharmacists transfer the prescription to the patient (or agent of the patient) and provide appropriate consultation" (Wisconsin Administrative Code, Chapter Phar 7.01(e)). Since Prescription Transfer already is required for Wisconsin pharmacists, interventions designed to help pharmacists comply with this regulation can be useful for improving Occurrence of Pharmacist - Patient Communication. In future research on Pharmacist - Patient Communication, it may be fruitful to study the occurrence of Prescription Transfer as well as Occurrence of Communication.

Findings from post hoc discriminant analysis conducted for predicting occurrence of Prescription Transfer are useful to help understand and interpret how this variable affects Occurrence of Communication. Results showed that Prescription Transfer more likely occurred when CRO was higher, more time was available,

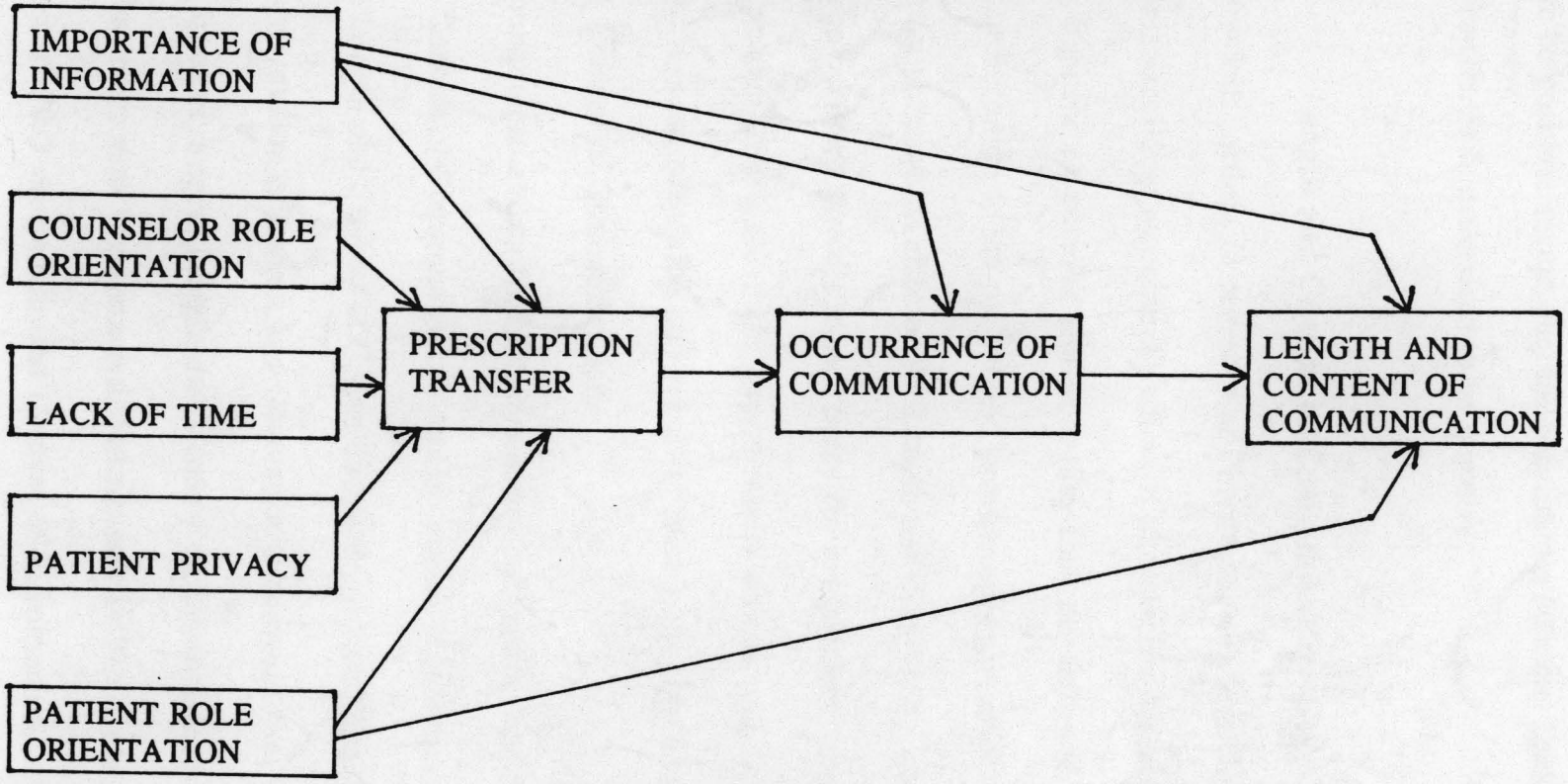
Importance of Information was higher, PRO was higher, and Patient Privacy was higher. It appears that Prescription Transfer depends mostly on initiation by the pharmacist. Pharmacists with higher CROs, perceive they have enough time, and place great importance on conveying information to particular patients, more likely transfer prescriptions to their patients. Pharmacists also may know which of their patients have a higher PRO for communication and transfer prescriptions to these patients, but avoid patients with low PROs.

Usually, patients are passive about whether they receive the prescription from a pharmacist or a clerk. Sometimes patients may think that a clerk actually is a pharmacist! Important interventions for improving the occurrence of Prescription Transfer may include changing pharmacists' CROs, and designing pharmacies so pharmacists have more time and more easily can transfer prescriptions to patients.

Based partly on these findings for predicting Occurrence of Communication, a revised model of Pharmacist - Patient Communication is proposed in Figure 4. The results suggest that Occurrence of Communication most significantly is affected directly by two variables: Prescription Transfer and Importance of Information. Five independent variables (Importance of Information, CRO, Lack of Time, Patient Privacy, and PRO) may affect Occurrence of Communication indirectly through their effects on Prescription Transfer, a mediating variable. All of the proposed relationships between variables with Occurrence of Communication in Figure 4 are

FIGURE 4

REVISED MODEL OF
PHARMACIST - PATIENT COMMUNICATION



hypothesized to be positive, except one: the relationship between Lack of Time and Prescription Transfer is hypothesized to be negative.

Length and Content of Communication

In the previous section, Occurrence of Pharmacist - Patient Communication related to pharmacists initiating communication. If pharmacists deemed Importance of Information high for a particular situation, they took the time and found a way to transfer the prescription to the patient and provide appropriate communication. In this section, variables which affected the Length and Content of Communication, if communication occurred, are discussed. Since the independent variables for this study were selected based on their hypothesized effects on Occurrence of Communication, it is not surprising that not all of them were significant predictors for Length and Content of Communication.

When communication occurred, Importance of Information and PRO affected the Length and Content of Communication. As Importance of Information and PRO increased, both Length and Content of Communication increased quadratically (the square root transformation of Length and Content of Communication was used for data analysis). In other words, Length and Content of Communication increased disproportionately more than Importance of Information or PRO increased.

The effect of PRO on Length and Content of Communication probably is

mediated by patient question asking behaviors. Patients with higher PROs more likely asked questions of their pharmacist. Of course, when a pharmacist answers the question, a longer period of communication will result and more content conveyed. The results showed that Length and Content of Communication probably increased quadratically as patients ask more questions or are more receptive to communication with their pharmacist. This finding may signify that pharmacists are willing to provide in-depth communication to patients if they are asked or believe that the patient needs or appreciates it.

The significant effects of PRO and Importance of Information on Length and Content of Communication are consistent with a finding from the exploratory study. In that study, pharmacists reported that patient motivation for communication and type of medication were the most important criteria they used to determine the amount and content of verbal counseling for a patient. Pharmacists probably determine when it is important to talk with a patient in a particular situation, and then provide about two to three types of important information geared for the patient's needs (see Table 9, Content column). The higher the Importance of Information, the more the pharmacist probably will discuss the information with the patient. But, if patients are receptive to communication or ask a question, even more communication will occur. If the patient does not appear interested, the pharmacist probably won't offer any more information to the patient.

In the exploratory study, pharmacists' also reported that Importance of Information varies depending upon the situation. Comparisons of three pairs of situations showed variability in pharmacists' importance ratings for different types of information to give a patient in different situations. The same results were seen in this study when actual behaviors were observed. For new prescriptions (for which patients more likely are not familiar), pharmacists provided information about directions for use and the purpose of the medication most often. For refill prescriptions (for which patients more likely are familiar), administrative information and solicitation of feedback occurred most often.

For all 360 cases in this study, the average Length of Communication was 38 seconds with an average of 2.6 types on information conveyed (see Table 9). When only cases for which communication occurred were used (N = 266), the average Length of Communication was 52 seconds with an average of 3.5 types of information conveyed (see Results chapter). Since patients only may be able to remember a small amount of information, the Length and Content of Communication, when it occurs, might be adequate. However, some patients commented they wanted more side effect information from their pharmacist. Only about one-third of the patients in this study received side effect information from their pharmacist during their observed visit to the pharmacy (see Table 28). Based on these results, it may be necessary to increase patients' question asking behaviors

for that information.

An important contribution of this study is the identification of PRO as an important influence on the Length and Content of Pharmacist - Patient Communication. Once communication occurs, patients can strongly influence what form that communication will take. Pharmacists appear to be perceptive of patient feedback and adjust their communication with patients accordingly. Therefore, if patients desire more information from their pharmacist, they must be educated about pharmacists' expertise and availability for communication.

The portion of the revised model of Pharmacist - Patient Communication in Figure 4, relating to Length and Content of Communication, was based on the previous discussion. Communication must occur for Length and Content of Communication to be greater than zero; thus the relationship between Occurrence of Communication and Length and Content of Communication. The model also posits direct, positive effects of Importance of Information and PRO on Length and Content of Communication.

In summary, the revised model of Pharmacist - Patient Communication reflects stages in the communication process between pharmacists and patients and variables which may affect those stages of communication. For meaningful dialogue between pharmacists and patients in community pharmacies, prescriptions should be transferred by a pharmacist, followed by initiation of communication. Even when

communication is initiated, Length and Content of Communication can be influenced by Importance of Information and PRO.

This revised model is consistent with findings reported by Svarstad et al. (1979). They divided the dispensing process into reception, packaging, distribution, and advisory stages and reported that communication between pharmacists and patients could be affected by variables from these stages.

Patients' Evaluation of Communication

The secondary goal of this study was to explore patients' evaluation of Pharmacist - Patient Communication. Patient Satisfaction/Dissatisfaction with Pharmacist - Patient Communication was selected for study since it could affect the occurrence of subsequent communication between a pharmacist and patient.

The results showed that, when communication occurred, most patients were very satisfied with communication they had with their pharmacist because their expectations were met or exceeded. Most patients expected very little, if any, communication with their pharmacist, so expectations easily were met or exceeded. Some patients commented that they only were picking up a refill prescription and didn't need to talk with their pharmacist on that visit.

There were some pharmacies which had patients with relatively high expectations for Pharmacist - Patient Communication because they had experienced

it in the past. Since they received what they expected or more than they expected, they too were very satisfied with Pharmacist - Patient Communication they received.

Patients' expectations for Pharmacist - Patient Communication appeared to be formed based on past experiences. If a patient patronized a pharmacy in which communication usually occurred only for new prescriptions, that patient only expected communication to occur for cases when he or she received a new prescription. Patients who patronized pharmacies in which communication occurred for all prescriptions expected to talk with their pharmacist on every pharmacy visit. During observations, some of these patients waited until the pharmacist got off the phone or finished a task to talk about their medications and health.

The key finding from this part of the study was support for Bitner's Model of Service Encounter Evaluation when it was applied to Pharmacist - Patient Communication. Patients who reportedly have their expectations for communication exceeded, report the highest satisfaction with the service. This finding supports the direct relationship between Confirmation/Disconfirmation and Service Encounter Satisfaction/Dissatisfaction (see Figure 3).

Also, the results showed that longer communications, with more types of information conveyed, lead to more positive disconfirmation of patients' expectations for communication. This finding shows that as Perceived Service Performance increases, the likelihood of exceeding Service Expectations also

increases (see Figure 3).

Only a small proportion of patients did not have their expectations met. Therefore, almost all patients were at least satisfied with Pharmacist - Patient Communication when it occurred. It appears that Bitner's Model of Service Encounter Evaluation can be useful for future research into patients' evaluation of Pharmacist - Patient Communication.

To create patient demand for Pharmacist - Patient Communication, patients' expectations for the service must be increased dramatically. Only when patient expectations for communication exceed performance will there be an active demand for Pharmacist - Patient Communication. Again, it appears that patients need to be educated about pharmacist communication services.

Two strategies can be used for increasing patients' expectations for communication. One strategy would be to increase the level of Pharmacist - Patient Communication so that more patients experience it more often and in more depth. They would come to expect the level of service they last received and on their next visit would change their behaviors to conform to what they believe is expected of them to receive the services they have come to expect.

The other strategy, according to Bitner's model, would be to change contextual cues and the traditional marketing mix in the pharmacy environment. These cues in the environment could change patients' expectations for the type of

service they are about to receive. For example, if a prescription department would look more like a bank or a doctor's office, cues for privacy and confidentiality of transactions would be conveyed. Presently, most pharmacies portray the image closer to that of a department store or a supermarket. It is no wonder why so many patients don't expect Pharmacist - Patient Communication.

Implications for Future Research

A Model of Pharmacist - Patient Communication was developed and tested. The six independent variables hypothesized to influence Occurrence of Pharmacist - Patient Communication were found significant. Also some of the independent variables were significant predictors for the Length and Content of Pharmacist - Patient Communication. For this study, the study variables were found adequately reliable and valid, but improvements could be made on the variables' measurement in future studies.

The revised model of Pharmacist - Patient Communication, presented in Figure 4, may be useful for future research in the area of Pharmacist - Patient Communication. An important contribution this study made for research in Pharmacist - Patient Communication was the relationships found for Prescription Transfer, Importance of Information, and PRO with Pharmacist - Patient Communication. These variables have not been studied extensively. Future research

aimed at a more in-depth understanding of these important variables is needed.

The focus for the revised model of Pharmacist - Patient Communication still is on what variables affect Occurrence of Communication. More research should be conducted to investigate the stages of communication and factors which influence these stages. For example, data collected from this study could be recoded and analyzed to investigate the effects of patient question asking and pharmacist solicitation of feedback on Length and Content of Communication. For this study, those variables were included as part of the measure for Content of Communication. Patient question asking and pharmacist solicitation of feedback may be important variables for predicting the Length of Communication and whether or not certain types of information (e.g. side effect information) are conveyed to patients.

Patients' role orientations for communicating with their pharmacist may be another fruitful area for future research. Interventions are needed to change some patients' attitudes toward and demand for Pharmacist - Patient Communication. Chewning (1992) found that patient fear/intimidation and patients' lack of awareness about pharmacists' expertise were patients' most common reasons for why people might not ask their pharmacist questions. Many patients are uninformed consumers of pharmacy services. To help identify interventions to increase patients' PROs, patients' expectations for communication with their pharmacist and how their PROs are formed should be studied as a first step.

The "pharmacist consultation movement" has evolved and intensified over the last 20 years (Dichter Institute for Motivational Research, 1973; Kessler, 1991). The next great task may be to intensify the "patient consultation movement" (National Council on Patient Information and Education, 1991) by which patients obtain adequate skills and positive role orientations for demanding and receiving counseling from pharmacists.

Another important contribution made in this study was the support shown for Bitner's Model of Service Encounter Evaluation when applied to Pharmacist - Patient Communication services. This model can be useful for future research aimed at understanding patients' evaluations of Pharmacist - Patient Communication.

In summary, two theoretical models were supported for research in Pharmacist - Patient Communication. The revised Model of Pharmacist - Patient Communication can be a useful tool for studies of the Occurrence, Length, and Content of Pharmacist - Patient Communication. The Model of Service Encounter Evaluation can be useful for studies of patients' evaluation of Pharmacist - Patient Communication.

Implications for Pharmacy Practice

The results have application to recently implemented regulations for Medicaid patients. The Omnibus Budget Reconciliation Act of 1990 (OBRA '90) included

provisions requiring Pharmacist - Patient Communication for Medicaid patients effective January 1, 1993. Strategies for improved compliance with this regulation can be recommended from the results. Pharmacists can utilize the results for planning changes in their practices for improving Pharmacist - Patient Communication. Costly structural changes in the pharmacy may not be needed if changes in the dispensing process or training of clerks (technicians) would correct problems in communication. In fact, building a state-of-the-art consultation room would be a waste of money if pharmacists don't transfer prescriptions to patients.

The earliest problem behavior should be identified as the one targeted for improvement. For example, managing pharmacists can monitor if pharmacists transfer prescriptions to patients in their practice. If not, this should be the target behavior for improvement and dispensing processes could be changed to facilitate Prescription Transfer.

Also, pharmacists could monitor if lack of Pharmacist - Patient Communication in their pharmacy is due to communication occurring for new prescriptions but not refills. If this is the case, one simple behavioral modification would bring them into compliance with OBRA '90 regulations. For patients who receive refill prescriptions and in the pharmacist's judgement don't need any new information, the pharmacist should ask patients how they are doing with the medication and if they have any questions. Asking this takes less than five seconds

and would provide patients the opportunity to ask questions and the opportunity to identify problems.

Results of this study can be useful to Medicaid representatives and other people who are responsible for monitoring compliance with OBRA '90. Compliance with the communication requirement could be assessed through unobtrusive observations in pharmacies checking that pharmacists transfer prescriptions to patients. Since practically all patients who receive their prescriptions from the pharmacist also receive communication, this would be a good estimation for the occurrence of communication in the pharmacies.

Evidence from observations conducted for this study suggests that pharmacists have unique "practice patterns." By observing a pharmacist for about two hours, his or her practice pattern can be identified. Therefore, suppose a pharmacist is observed to transfer prescriptions to patients about half the time during a two hour period. That would be a good estimation for how often that pharmacist transfers prescriptions to patients overall.

Although not collected or analyzed systematically, anecdotal evidence from pharmacy visits can provide useful information for pharmacists to improve Pharmacist - Patient Communication in their pharmacy practices. For example, some pharmacists who participated in this study left completed prescriptions unbagged until the patient came to pick them up. Patients had to ask the pharmacist

for these prescriptions because they were left unbagged behind the prescription counter. This kept the pharmacist in control of medication distribution and enabled the pharmacist to view prescription labels as he or she handed prescriptions to patients.

In contrast, other pharmacists bagged completed prescriptions and literally threw them over the counter to a clerk who would place them on a shelf alphabetically by patient name. When the patient came in to pick up the prescription, the clerk would find the bag and complete the transaction. Often, pharmacists were hidden behind the counter and had no contact with these patients. For these cases, the pharmacist had lost control over medication distribution once they transferred that control to a clerk.

In some pharmacies, clerks (technicians) were trained to perform only duties which supported the pharmacist. They were not allowed to transfer prescriptions to patients or answer drug related questions. If a patient asked these clerks a drug related question, they were trained to ask the patient to wait while they got the pharmacist.

In other pharmacies, clerks were trained to perform all transactions at the cash register in the absence of the pharmacist. At one pharmacy, pharmacists never came out from behind a counter which was located behind the clerks "cash register counter." Pharmacists would "toss" prescriptions over the counter to the clerk, who

then transferred the prescriptions to the patient. Sometimes the bag was marked to signify consultation was needed. In these cases, the clerk was trained to ask the patient to walk over to a consultation area to talk with the pharmacist. Otherwise, pharmacists were doing the manual functions for packaging prescriptions, while clerks interacted with patients. In some cases, clerks provided medication counseling for patients who received prescriptions they had never taken before.

It was interesting to see how much power clerks could have over the prescription dispensing process. In a few pharmacies, clerks sometimes would need to be away from their cash register to run an errand or other duty. In the clerk's absence, the pharmacist would conduct transactions with patients. However, if the clerk returned while the pharmacist was conducting a transaction, he or she would "take over" for the pharmacist. The pharmacist would leave the area and take his or her "appropriate" place hidden behind the counter.

The pharmacies just mentioned that had "hidden" pharmacists, were designed with specified consultation areas. The presence of a consultation area did not improve the Occurrence of Communication. They were not utilized because the process of dispensing prescriptions was not conducive for Prescription Transfer. Proper training of clerks and providing a process of dispensing by which the pharmacist transfers prescriptions to patients is necessary before consultation areas will be utilized.

Pharmacies in which the most communication occurred did not have specified consultation areas. The most important factor appeared to be how clerks were trained and utilized. Clerks (technicians) are very useful for helping pharmacists have enough time to communicate with patients if they are utilized properly. If not trained and utilized properly, clerks (technicians) actually can hinder the Occurrence of Pharmacist - Patient Communication because they, rather than the pharmacist, transfer prescriptions to patients.

The argument can be made that pharmacists in low volume pharmacies have the luxury of leaving completed prescriptions unbagged, transferring prescriptions to patients, and taking time to talk with patients. In an extremely high volume pharmacy there just is not enough space to leave prescriptions unbagged. Also, there is so much going on in a high volume pharmacy, with up to eight pharmacists and clerks "running around" there is no way a pharmacist can transfer completed prescriptions to patients.

Herein, I believe, lies the problem for the lack of Pharmacist - Patient Communication. High volume pharmacies required many pharmacists and clerks to be on duty at once. This created confusion and discontinuity. Dispensing functions were divided among employees so that each employee was responsible for only a part of dispensing a prescription for a patient. Dickson and Rodowskas (1975) found support for this idea. They reported the largest direct effect on Pharmacist - Patient

Communication was prescription department staffing. As the number of staff increased (professional and unprofessional) in the prescription department, the amount of time pharmacists devoted to patient communication decreased.

One alternative method to facilitate Prescription Transfer under conditions of high staffing would be to create separate cubicles for each pharmacist. Patients could queue for prescription service similar to waiting for a bank teller. With the aid of counting machines, technicians could package the prescriptions while the pharmacist analyzed the prescription order, prepared the label, conducted prospective drug regimen review, and checked the accuracy of the packaged prescription. In very large pharmacies, pneumatic tubes could be utilized for transferring packaged prescriptions to the pharmacist in the cubicle. In pharmacies this large, a pharmacist could be placed in the packaging area for checking accuracy.

There are other processes for dispensing prescriptions to patients besides the one just mentioned. The key for facilitation of Pharmacist - Patient Communication is to design a process in which the pharmacist transfers completed prescriptions to patients.

One problem in the suggestion that pharmacists transfer each prescription to the patient, is that pharmacists would need to rely more on clerks (technicians) for packaging medications. During hurried times, pharmacists may not adequately check

that the correct medication was packaged. According to Baker (1992), the most common causes of pharmacy malpractice claims still are related to the wrong drug being dispensed (54.9 percent of claims). Pharmacists are required to assure correct packaging of medications as well as provision of counseling to patients. It is easy to understand why some community pharmacists feel like they need to be in two places at once.

Some dispensing processes used by pharmacists focus only on preparing and packaging the correct medication for patients. Information and advice about appropriate use of medications, which are becoming more and more complex, often are not given to patients. Creative ideas for new dispensing processes are needed to help pharmacists fulfill all of their duties.

Study Limitations

Theoretical

The Model of Pharmacist - Patient Communication included only six variables which were hypothesized to affect Occurrence, Length, and Content of Communication. Other variables which may affect Pharmacist - Patient Communication (e.g. length of acquaintance between pharmacist and patient) were

not included in this study.

Patient question asking and pharmacist solicitation of feedback were items used to measure Content of Communication. From a theoretical perspective, it may be more useful to treat those items as independent variables for predicting elements of communication rather than items for measuring Content of Communication.

Bitner's Model of Service Encounter Evaluation was not designed specifically for pharmacy service encounters. While supported for Pharmacist - Patient Communication on an exploratory basis, alterations to her model may be necessary for future studies.

Methodological

The study design was descriptive in nature. Since an experimental design was not used, causality cannot be inferred from the results.

Judgement samples of pharmacists and pharmacies were used. Although care was taken to select pharmacists and pharmacies resembling those in Wisconsin, results of this study should not be considered reflective of pharmacy practice in Wisconsin. However, the judgement samples were diverse enough to yield insight about pharmacist - patient communication under different conditions of community pharmacy practice.

Communications between pharmacists and patients for prescriptions which were delivered or mailed were not included in the study. Therefore, the results apply only to face-to-face pharmacist - patient encounters in community pharmacies.

Based on results of exploratory factor analysis used for supporting discriminant validity of measures, the measurement of patients' PRO and their perceived Importance of Information may not have been measured as well as they could have. Items used to measure patients' perceptions for these variables were developed by a pharmacist, based on pharmacy literature, and an exploratory study conducted on pharmacists. These measures likely contained pharmacist related biases.

Observation effects could have affected results of this study. If pharmacists and patients knew they were being observed during data collection, they may have behaved differently than if they had not known. However, Ortiz et al. (1989) reported that effects of the presence of an observer on pharmacist counseling behaviors was minimal and provided more accurate measurements than other methods. In this study, pharmacists' routines and communication habits were noted before data collection started. When observations took place with pharmacists' knowledge, similar behavior patterns were seen. The only detectable changes in pharmacist behaviors occurred during approximately the first 15 minutes of observations. During this time, pharmacists often would look up at the researcher.

After about 15 minutes, pharmacists settled into their routine.

Almost none of the patients looked at (or presumably saw) the researcher during observations. If a patient did look at the researcher, the researcher behaved as if he were taking inventory of the products he was standing next to. Patients were asked for their participation as they exited the pharmacy.

Comparisons between groups of "early" observations and "late" observations in pharmacies showed no differences for Occurrence, Length, or Content of Communication. Assuming that observation effects are more pronounced during early observations and wear off over time, significant observation effects were not found.

Since patients were interviewed **after** they had received their prescription, their responses may have been influenced by their pharmacy encounter. For example, patients' responses to the question about how important communicating with their pharmacist was for that visit may have been influenced by whether they communicated with their pharmacist or not. It is unknown, then, if patients' perceived importance of talking with their pharmacist affected pharmacist - patient communication or vice versa. Since patients' perceived importance of talking with their pharmacist was correlated with pharmacists' perceived importance and the objective measure of importance, the effect of this limitation on the results of this study may be minimal.

VII. SUMMARY AND CONCLUSIONS

Observations of pharmacist - patient interactions, patient interviews, and pharmacist interviews were used to collect information about Pharmacist - Patient Communication in 12 Wisconsin pharmacies. The primary goal of this study was to identify variables which affect Pharmacist - Patient Communication and test their effects in community pharmacy practice. A secondary goal was to explore patients' evaluation of Pharmacist - Patient Communication.

For communication to occur, prescriptions should be transferred to the patient by a pharmacist. This behavior was identified as the primary problem behavior for why Pharmacist - Patient Communication does not take place. Pharmacists play the strongest role in determining if Prescription Transfer will occur or not. Pharmacists make a determination about how important it is to communicate with a patient for a particular dispensing situation and will initiate communication with the patient for situations the pharmacist deems important. Pharmacists base their judgements about importance of communicating with patients on their perceptions about how motivated the patient is to receive communication from a pharmacist and on the seriousness of the dispensing situation. For example, if a patient seems to be in a hurry and only getting a refill prescription which he or she has taken for years, a pharmacist won't place much importance on communicating with that patient. Subsequently, the pharmacist is not as likely to transfer the prescription to the

patient and provide communication services.

A pharmacist's Counselor Role Orientation (CRO) also affects whether he or she decides to transfer the prescription to the patient and provide communication services. Pharmacists with more positive CROs more likely communicate with patients.

To increase Occurrence of Pharmacist - Patient Communication in community pharmacies, Prescription Transfer should be the primary targeted behavior for change. In order to help increase communication between pharmacists and patients, ways to have pharmacists transfer prescriptions to patients without compromising other important areas of pharmacy practice are needed. Three ways to increase Prescription Transfer were identified from this study: (1) increase pharmacists' CROs, (2) increase the level of importance pharmacists place on communicating with patients, and (3) change dispensing processes in order to facilitate prescription transfer by pharmacists.

While pharmacists play the strongest role in Occurrence of Pharmacist - Patient Communication, patients play an important role in Length and Content of Communication. Pharmacists tailor the length and content of communication based on a patient's needs and receptivity for communication. Patients with higher PROs ask more questions of their pharmacist and probably are more receptive to communication from a pharmacist. These factors draw out more types of

information from pharmacists. Then, of course, it takes longer to provide more information to patients. The results showed that the Length and Content of Communication probably increase quadratically as patients ask more questions or are more receptive to communication with their pharmacist. This finding may signify that pharmacists are willing to provide in-depth communication with patients if they are asked or believe the patient needs or appreciates it.

Pharmacists in this study provided an average of about three types of information to patients with whom they communicated. It is not known whether this amount of communication or the types of communication they provided were adequate. Based on patients' comments, some of them would like more information about side effects. Pharmacists commented that they are reluctant to provide some side effect information because it my scare patients into not taking the medication. Only if patients ask for this information would they provide it.

One way to help patients receive side effect information they desire would be to target patients for behavior change in order to "draw out" desired information from pharmacists. Future research in this area should be designed to investigate how patients' PROs are formed and changed. Then, strategies could be developed to help patients become aware of pharmacists' expertise and feel more comfortable in asking pharmacists about side effects and other information they desire.

Patients reportedly were satisfied with Pharmacist - Patient Communication

because they received what they expected or more than they expected. Patients' expectations for Pharmacist - Patient Communication appeared to be formed based primarily on past experiences and were quite low. To create patient demand for Pharmacist - Patient Communication, patients' expectations for the service must be increased. Only when patient expectations for communication exceed performance will there be an active demand for Pharmacist - Patient Communication.

One strategy that could increase patients' expectations for communication, would be to increase the level of Pharmacist - Patient Communication so that more patients experience it more often and in more depth. They would come to expect the level of service they last received and on their next visit would change their behaviors to conform to what they believe is expected of them to receive the services they have come to expect.

Another strategy would be to change contextual cues and the traditional marketing mix in the pharmacy environment. These cues in the environment could change patients' expectations for the type of service they were about to receive. For example, making the pharmacist more visible and accessible to patients may serve as a cue for increased patient expectations for communication with a pharmacist.

In summary, results from this study have application for improving Pharmacist - Patient Communication. Roles of pharmacists, patients, and contextual cues in Pharmacist - Patient Communication were identified and described.

Relationships between independent variables and Occurrence of Communication proposed in The Model of Pharmacist - Patient Communication were supported by the results. Some of the relationships between the independent variables and the Length and Content of Communication proposed in the model were supported. Patients' evaluation of Pharmacist - Patient Communication also was explored. Part of Bitner's Model of Service Encounter Evaluation was applied to patients' evaluation of Pharmacist - Patient Communication and was supported.

A contribution of this study was the relationships found among Prescription Transfer, Importance of Information, and PRO with Pharmacist - Patient Communication. Interventions for improving communication between pharmacists and patients can be developed based on the results.

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APPENDIX A

EXAMPLES OF RESEARCH CONDUCTED ON DRUG MISADVENTURING

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Jenkins (1954) Fifty percent of 22 patients studied failed to comply with their medication therapy as determined by dosage unit count methods.

Mohler et al. (1955) Of 245 patients surveyed, 34.3 percent were noncompliant with a penicillin regimen (took less than prescribed).

Simpson (1956) Twenty-three percent of 100 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Dixon et al. (1957) Fifty percent of 151 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Leggat (1957) Twenty-two percent of fifty tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Fox (1958) Four percent of 79 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Breite (1959) Sixty-five percent of the 76 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Feinstein et al. (1959) Forty-five percent of 109 patients prescribed penicillin and 56 percent of 120 patients prescribed sulfadiazine failed to comply with their medication therapy as determined by dosage unit count methods.

Pitman et al. (1959) Forty-eight percent of the 61 tuberculosis patients admitted taking their medications irregularly or not at all.

Chaves (1960) Forty percent of the 2622 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Ireland (1960) Eighteen percent of the 87 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Luntz and Austin (1960) Thirty-four percent of the 705 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Schwartz et al. (1962) Of 178 patients aged 60 or over 59 percent made some medication error. Forty-six (26 percent) were potentially serious.

Bergman and Werner (1963) Of 59 children prescribed penicillin for 10 days, therapy was terminated by day three for 56 percent and by day 9 for 82 percent.

Renton et al. (1963) Forty-six percent of 124 schizophrenic patients did not take their medication as prescribed at the time of discharge.

Park and Lipman (1964) Fifty-one percent of 36 patients prescribed imipramine failed to comply with the regimen as determined by dosage unit count.

Schimmel (1964) Ten percent of 1014 inpatients in a USA hospital experienced an adverse drug reaction.

Cluff et al. (1965) Fourteen percent of 714 inpatients in a USA hospital experienced an adverse drug reaction.

Lipman et al. (1965) Forty-three percent of 254 neurotic patients deviated from their prescribed regimen by taking less than 75 percent of the medication.

Leistyna and Macaulay (1966) Eleven percent of 162 patients prescribed penicillin failed to comply with the medication regimen as determined by dosage unit count and interview.

Malahy (1966) Of 40 patients (four groups of 10) between 36 to 90 percent of the patients in each group made medication errors.

Marrow and Rabin (1966) Thirty-two percent of 350 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Seidl et al. (1966) Fourteen percent of 714 inpatients at a USA hospital had an adverse drug reaction detected.

Smith et al. (1966) Eleven percent of 900 inpatients at a USA hospital experienced an adverse drug reaction.

Hoddinott et al. (1967) Twenty-five percent of 104 inpatients in a Canadian hospital experienced an adverse drug reaction.

Ogilvie and Ruedy (1967) Eighteen percent of 731 inpatients at a Canadian hospital experienced an adverse drug reaction.

Sidel et al. (1967) Eleven percent of 267 inpatients at a USA hospital experienced an adverse drug reaction.

Watkins et al. (1967) Fifty-eight percent of 115 diabetic patients made medication errors with their insulin.

Wynn-Williams and Arris (1968) Twenty-one percent of 153 tuberculosis patients failed to comply with their medication therapy as determined by negative urine tests for the drug.

Clinite and Kabat (1969) Thirty men returning home after hospitalization were interviewed 6-8 days after discharge. Twenty percent resumed therapy with drugs that had been prescribed prior to hospital admission. Twenty-five percent of the doses were taken in error (omission or extra dose).

Duff and Sommers (1969) Based on 1000 interviews, 20.8 percent did not take the medication at the prescribed time, 18.8 percent did not take all of the medication, and 18.5 percent gave the medication to another person.

Gordis et al. (1969) Based on urine tests, noncompliance with physicians' instructions for continuous penicillin prophylaxis against rheumatic fever recurrences was estimated between 58 and 67 percent.

Hurwitz (1969) Ten percent of 1160 inpatients in a UK hospital experienced an adverse drug reaction.

Latiolas and Berry (1969) 180 hospitalized patients in six clinical groups were interviewed. Forty-two percent committed medication errors. The most common reason for committing the error was lack of patient understanding of instructions.

Meleney and Fraser (1969) Thirty-six percent of 749 outpatients in the USA experienced an adverse drug reaction.

Porter (1969) Seventy-seven percent of 301 patients failed to comply with their medication regimen as determined by dosage unit counts.

Slone et al. (1969) Thirty-one percent of 2514 inpatients of three USA hospitals experienced an adverse drug reaction.

Arnhold et al. (1970) Nineteen percent of 104 patients taking penicillin failed to comply with their medication regimen as determined by dosage unit count methods.

Gardner and Watson (1970) Fifteen percent of 939 inpatients at a USA hospital experienced an adverse drug reaction.

Libow and Mehl (1970) Twenty elderly patients at a hospital were given a placebo

prescription. Twenty-five percent committed medication errors.

Moulding et al. (1970) Thirty-one percent of the 122 tuberculosis patients studied took less than 70 percent of their medication.

Bergman et al. (1971) Twenty-one percent of 113 inpatients at a USA hospital experienced an adverse drug reaction.

Stewart and Cluff (1971) Fifty-one percent of 75 outpatients at a USA clinic experienced an adverse drug reaction.

Wang and Terry (1971) Two percent of 8991 inpatients at a Canadian hospital experienced an adverse drug reaction.

Smidt and McQueen (1972) Three percent of 9104 inpatients at a New Zealand Hospital experienced an adverse drug reaction.

Gray et al. (1973) Forty-four percent of 170 inpatients at a USA hospital experienced an adverse drug reaction.

Kellaway and McCrae (1973) Thirty-two percent of 200 patients discharged from acute medical wards in New Zealand experienced an adverse drug reaction.

Mulroy (1973) Three percent of 9315 outpatients in the UK experienced an adverse drug reaction.

Boyd et al. (1974) For 134 patients taking 380 prescriptions only 22 percent consumed them properly.

Caranosos et al. (1974) Three percent of 6093 hospital patients in the USA were admitted due to an adverse drug reaction.

Miller (1974) Four percent of 7017 patients at seven hospitals were admitted due to adverse drug reactions.

Vakil et al. (1975) 20 percent of 338 inpatients at an Indian hospital experienced an adverse drug reaction.

Burnum (1976) Four percent of 1000 patients experienced adverse drug reactions, of which over half were classified as avoidable.

Klein et al. (1976) Nineteen percent of 914 inpatients in a Swiss hospital experienced an

adverse drug reaction.

Law and Chalmers (1976) Of 132 patients aged 75 or older, 30 percent were not compliant with their medication regimen.

McKenney and Harrison (1976) Of 216 patients admitted to a hospital, 27.3 percent had a medication related problem associated with admission. Eleven percent experienced an adverse drug reaction (in 7.9 percent the adverse drug reaction caused admission).

Brand et al. (1977) Of 225 patients interviewed six months after hospital discharge, 40.4 percent were noncompliant with their medication regimen.

Levy et al. (1977) Fifteen percent of 2771 inpatients at four Israeli hospitals experienced an adverse drug reaction.

MacDonald et al. (1977) Sixty recently discharged elderly patients were tested for compliance by pill count. After one week, 67 percent were noncompliant and after six weeks 77 percent were noncompliant with their medication regimen.

May et al. (1977) Thirteen percent of 10,518 inpatients at a USA hospital experienced an adverse drug reaction.

Campbell et al. (1978) Two percent of 154,480 outpatients in the USA experienced an adverse drug reaction.

Levy et al. (1979) Four percent of 2499 hospital patients in Israel were admitted due to an adverse drug reaction.

Martys (1979) Forty-one percent of 817 outpatients In the UK experienced an adverse drug reaction.

Crome et al. (1980) Of 51 elderly patients, 67 percent were not compliant with their medication regimen.

George and Kingscombe (1980) Two percent of 250 patients at a UK hospital experienced an adverse drug reaction.

Levy et al. (1980) Six percent of 2933 hospital patients in Berlin were admitted due to an adverse drug reaction.

Spriet et al. (1980) Thirty-eight percent of 1662 patients were noncompliant with their medication regimen.

Stewart et al. (1980) Twenty percent of admissions to a psychiatric service were attributable to noncompliance, adverse drug reactions, or overdosage.

Bergman and Wiholm (1981) A drug-related problem was judged to have been the main reason for admission of 36 patients, and a strong contributory reason for 9 patients out of 285 consecutive admissions to two medical wards in a Swedish university hospital.

Cooper et al. (1982) One hundred eleven patients aged 60 or older were sampled. Of these, 43 percent were noncompliant with their medication regimen.

German et al. (1982) Four hundred and two patients discharged from a hospital were interviewed over the telephone. Fifty-two percent were not compliant with the frequency and/or quantity of the medication regimen.

Ramsay et al. (1982) A survey of urgent admissions to a general medical unit in Sheffield in 1978 showed that about 25 percent of admissions were related to drug-related illness, 18 percent by self-poisoning, 3 percent by adverse reactions, and 1 percent by non-compliance with drug treatment.

American Association of Retired Persons (1984) About 40 percent of elderly respondents reported they stopped taking a prescription drug prior to completion of the whole regimen. Another 20 percent reported they had refused at least once to have a prescription dispensed to them.

CBS Television (1984) Almost half of all households surveyed reported borrowing or using previously prescribed medication for a similar illness or condition.

Edwards and Pathy (1984) Of 44 discharged patients aged 65 or older, 57 percent were not compliant with their medication regimen.

Klein et al. (1984) Thirty percent of 299 outpatients in the USA experienced an adverse drug reaction.

Salem et al. (1984) Forty-one consecutive admissions to an inpatient psychiatric service were monitored prospectively for drug-related problems. During the four-month study, 54 percent of the admissions were determined to be drug-related; in 29 percent, a drug-related problem was identified as the primary cause of hospitalization.

Cooke et al. (1985) Five percent of 300 hospital patients in South Africa were admitted due to an adverse drug reaction.

Ostrom et al. (1985) One hundred eighty-three elderly in independent living apartments

were interviewed. Of those using medications, 37 percent had a label discrepancy in dosing, 27 percent had a potential drug interaction, and 24 percent underused their medications.

Hutchinson et al. (1986) Five percent of 1026 patients attending a Canadian outpatient clinic experienced an adverse drug reaction.

Lakshmanan et al. (1986) Four percent of 834 hospital admissions in Ohio were attributable to adverse drug reactions. Half were classified as preventable.

Lumley et al. (1986) Two percent of 36,470 outpatients of 24 UK general practices reportedly experienced an adverse drug reaction.

Trunet et al. (1986) Out of 1651 patients admitted during a 33-month period to an intensive care unit, 6 percent were admitted because of drug-induced illness. Half were judged to be potentially avoidable.

Rupp et al. (1988) An audit of prescribing errors was conducted at nine Indiana pharmacies. Three percent of new prescription orders required active pharmacist intervention to correct or resolve a prescribing error.

Col et al. (1990) Three hundred fifteen elderly patients admitted to an acute care hospital were interviewed. Twenty-eight percent of the admissions were drug related. Seventeen percent were due to adverse drug reactions and 11 percent were due to noncompliance.

Hallas, Haghfelt, et al. (1990) Three hundred sixty-six consecutive patients admitted to a department of cardiology were evaluated for drug events as a cause of admission. Definite or probable drug events accounted for 4 percent of the admissions.

Hallas, Harvald, et al. (1990) Three hundred thirty-three consecutive patients in a medical ward were evaluated for drug events as a cause of hospitalization. Eleven percent of all admissions were drug-related.

APPENDIX B

EXAMPLES OF RESEARCH CONDUCTED ON THE EFFECTS OF PHARMACEUTICAL CARE

EXAMPLES OF RESEARCH CONDUCTED ON THE EFFECTS OF PHARMACEUTICAL CARE

HOSPITALIZED PATIENTS

Hatoum et al. (1986) Three hundred and five articles published between 1974 and 1984 pertaining to pharmacy services in institutional acute-facilities were reviewed. In these articles researchers reported findings that support the notion that pharmaceutical care can increase appropriate use of medications, increase compliance, increase patient understanding and recall of medication regimens, decrease adverse drug reactions, and decrease costs. The authors concluded that "it is evident that the (pharmacy) profession has made significant strides in building a strong scientific data base to support the value of its clinical services."

Caldwell and Davis (1987) Staff pharmacists at a 540-bed hospital were effective in reducing the use of parenteral H-2 antagonists by using chart education sheets. This reduction translated to an estimated annualized cost savings of $23,321.

Clapham et al. (1988) This study was conducted in a 1058-bed university teaching hospital. The results suggested that a drug-use control system overseen by clinically experienced pharmacists may be associated with shorter patient length of stays and lower total costs than centralized systems without pharmacist involvement.

Hatoum et al. (1988) Clinical pharmacists at a 530-bed hospital made 1027 interventions in patient drug therapy which included recommendations about changing a drug, changing a dosage, changing a regimen, drug monitoring, and drug discontinuance. Peer reviewers judged 983 of these interventions to improve drug therapy. Thirty-six were deemed to save the patients' lives or preserve major organ functions. Cost-avoidance averaged $242 for each intervention implemented.

LONG TERM CARE FACILITY PATIENTS

Kidder (1987) Twenty-three studies of drug-regimen review in long term care facilities were reviewed. Based on the review, Kidder estimated potential net national savings (benefits) of $220.3 million from reduced drug use ($81.6 million) and averted hospitalizations ($224.0 million), given the cost of pharmacists' time to conduct the reviews ($85.3 million).

Kreling and Schommer (1990) Direct costs of potentially inappropriate psychotropic orders for 760 long term care facility residents were calculated.

Overall, 80.7 percent of the dollars spent for psychotropic orders in this population may have been wasted because of potentially inappropriate use.

AMBULATORY PATIENTS

Cole and Emmanuel (1971) Overall, 90 percent of patients who received pharmacist discharge drug consultation were compliant with their medication regimen compared to only 24 percent of patients who did not receive consultation.

Madden (1973) Pharmacist-patient counseling for a prescription order for penicillin, sulfisoxazole, or tetracycline was evaluated. Forty-three percent of the patients in the control group had an error rate over 20 percent and 21 percent had an error rate over 50 percent. Only 31 percent of the patients in the study group had an error rate over 20 percent and 6 percent had an error rate over 50 percent.

McKenney et al. (1973) Clinical services provided by a pharmacist significantly improved patients' knowledge of hypertension and its treatment, increased patients' compliance with therapy, and increased the number of patients whose blood pressures were kept within the normal range.

Chubb and Winship (1974) Two samples of 14 cardiac and 20 hyperlipoproteinemic outpatients each were divided randomly into experimental and control groups. The experimental groups received instructions from a pharmacist. The percentage of misused doses for patients taking digoxin were lower in the experimental group (7.9 percent) than in the control group (35.7 percent). The percentage of misused doses for patients taking a diuretic were lower in the experimental group (8.6 percent) than in the control group (36.4 percent).

Dickey et al. (1975) A pharmacist-patient eduction program for parents of patients with otitis media increased compliance with the regimen from 5 percent to 50 percent.

Ryan et al. (1975) One thousand patients upon discharge from the surgery service of a university hospital received medication consultation from a pharmacist. Savings of about $1700 were realized on 517 out of 1,832 prescriptions; this was equal to $9.13 per hour of consultation time.

Fudge and Vlasses (1977) A pharmacy education program to teach a 14 year old hemophiliac to self-administer factor VIII at home realized a cost savings of $20,300 in the first year and increased school attendance 15 percent.

MacDonald et al. (1977) The effect of counseling by a pharmacist on medication errors

was assessed in 165 elderly patients following hospital discharge. Counseled patients made less that one-third of the errors made by uncounseled patients.

Sczupak (1977) Forty patients were assigned randomly to either a study or control group. Pharmaceutical services were given to the study group patients. More incidents were recorded in the control group for inadequate patient information required for self-administration and errors in patient administration.

McKenney et al. (1978) Hypertensive patients who received drug monitoring and patient education services from their pharmacist showed better compliance and blood pressure control than patients who did not.

Rosen and Holmes (1978) Pharmacist monitoring of medications for about 200 psychiatric patients per month cost 40 percent of the cost of providing the service by a psychiatrist. The pharmacist's patients were functioning in the community as well as or better than other patients, and their reported satisfaction was at least that of other patients.

Skoutakis, et al. (1978) Pharmaceutical care services by a pharmacist improved hemodialysis patients' knowledge, compliance, and therapeutic responses. These improvements reversed in the absence of the pharmacist's services.

Gray et al. (1979) Clinical pharmacy services provided in a three month study period at a VA outpatient clinic resulted in a decreased incidence and severity of adverse drug effects, fewer drug use problems, a reduction in the total number of drugs prescribed, improved patient drug knowledge, and reduced expenditures for health care.

Helling et al. (1979) Direct clinical pharmaceutical services reportedly increased patient acceptance of medical care services and overall satisfaction with health care.

Pathak and Nold (1979) For every dollar charged by a pharmacist-conducted patient training program for self-administration of parenteral drugs at home,
1.25 days of hospitalization and $321.90 in hospital charges were saved.

Powell et al. (1979) Sixty-five diabetic patients received an education program from pharmacists. After 90 days, the program was successful in producing improvements in both knowledge and compliance, but a need for individualization of patient education efforts was indicated.

Cable and Schneider (1982) Fourteen patients were seen regularly by a pharmacist at a compliance clinic. Of these, 79 percent achieved greater than 80 percent compliance with their medication regimen, 43 percent demonstrated reductions in emergency room visits, and 57 percent exhibited reduced hospitalizations.

Joyner et al. (1983) A medication monitoring service was provided by a clinical pharmacist to geriatric patients in two congregate housing facilities during an 18 month period. Fourteen patients were referred to the service because of problems with noncompliance with their medication regimen. After receiving the service, an 82-100 percent compliance rate was recorded.

Cummings et al. (1984) The effect of comprehensive pharmacy services on the hospitalization patterns of ambulatory patients was studied. Patients in the study group had fewer admissions and spent a significantly smaller proportion of patient days in the hospital than did the control group.

Garabedian-Ruffalo, et al. (1985) The effectiveness of a pharmacist-managed warfarin anticoagulation clinic was evaluated using retrospective chart reviews. The percentage of patients requiring hospitalization (39 percent versus 4 percent) and the percentage of prothrombin times outside the therapeutic range (35.8 percent versus 14.4 percent) were significantly higher during the preclinic phase than during the clinic phase.

Hammarlund et al. (1985) Medication behaviors of 183 elderly apartment residents were assessed for problems in medication regimen compliance, regimen comprehension, drug interactions, and medication storage. One year after the educational intervention given by pharmacists, 39 residents, who initially were found to have the greatest number of problems, showed a significant 11 percent decrease in the number of prescriptions taken and a significant 39 percent decrease in the number of medication behavior problems.

McKenney and Witherspoon (1985) An outpatient clinical pharmacy program was provided to 39 antihypertensive-treated and 16 warfarin-treated study patients. Results showed that a significantly greater number of drug discontinuations and changes were documented in study patients compared with nonstudy patients. Hypertensive patients who received the services had poorer blood pressure control at the beginning of the study, but were equally as well controlled as nonstudy patients by the end of the study. Warfarin-treated study patients were better controlled at the end of the study than nonstudy patients.

Menard, et al. (1986) Medication compliance improved 11 percent during the study period in which care was given to patients by a pharmacist prescriber. Physician reviewers agreed with the pharmacist's decisions in 93 percent of the patient visits.

Morse, et al. (1986) Twenty ambulatory patients who had diastolic blood pressures greater than 96 mm Hg on two consecutive office visits were enrolled in the study. After pharmacist counseling to patients and medication therapy recommendations to physicians, significant improvement in blood pressure control was achieved.

Rantucci and Segal (1986) Verbal counselling by a pharmacist increased patients'

knowledge regarding precautions, contraindications and side effects of OTC medication and decreased the incidence of some types of inappropriate use.

Rupp (1988) Of 5874 new prescriptions dispensed by pharmacists during the study 153 (2.6 percent) required pharmacist intervention. In 38 instances, a panel of experts agreed that the documented error may have resulted in patient harm if pharmacist intervention had not been conducted. The cost of pharmacist time to conduct an intervention was estimated to be $1.75. The cost of medical care avoided was estimated to be $7.15.

Phillips and Carr-Lopez (1990) Pharmacist-conducted review of geriatric patients' medication profiles resulted in a 32 percent reduction in the total number of prescriptions, a 42 percent decrease in adverse drug reactions, and a direct cost savings of $53.75 per patient over six months.

Britton and Lurvey (1991) The effect of medication profile review by a clinical pharmacist on prescribing in a general medicine clinic was studied. Results showed the intervention reduced both the number and cost of drugs for patients receiving five or more medications.

Martin (1991) Researchers at Purdue University School of Pharmacy, in collaboration with four other schools of pharmacy, estimated the total value that pharmacists added during the study was over $76,000. The mean value that pharmacists added to each prescription that was screened during the study was $2.32.

Sclar et al. (1991) A health education program designed to enhance compliance with a once-daily regimen of atenolol was evaluated among 453 patients over a 180-day period. Patients enrolled in the program had significantly more "number of days' supply" of atenolol than patients in the control group.

APPENDIX C

EXAMPLES OF RESEARCH CONDUCTED ON THE OCCURRENCE OF PHARMACIST - PATIENT COMMUNICATION

EXAMPLES OF RESEARCH CONDUCTED ON THE OCCURRENCE OF PHARMACIST - PATIENT COMMUNICATION

Knapp et al. (1969) Researchers posed as patients and presented a tranylcypromine prescription followed by an imipramine prescription one week later at twelve pharmacies. Only one pharmacist, using a patient-record system, detected the contraindication and called the prescriber.

Kotzan and Williams (1972) Two hundred-nine patients obtaining prescriptions from a sample of community pharmacies were observed unobtrusively. About 82 percent received no verbal communication from their pharmacist.

Boyd et al. (1974) Interviews were conducted with 134 patients who received 380 prescriptions. Pharmacists reportedly gave verbal instructions to male patients on only 8.5 percent of the prescriptions and to female patients on 17.9 percent.

Rowles et al. (1974) Only five percent of the pharmacists in this study gave the minimal pharmaceutical service of a properly prepared prescription requiring compounding with appropriate counseling. Seventy-three percent of the patients received no instruction on compounded medications they obtained.

Campbell and Grisafe (1975) Pharmacy students posed as patients and presented a prescription for Benemid at 212 pharmacies. In 81 percent of the cases, the pharmacist met with the patient (student), but in only 47 percent of the cases did the pharmacist explain the directions.

Hammel and Onaga (1976) Results of a survey mailed to pharmacists showed the mean estimate of what proportion of prescriptions they believed being dispensed along with appropriate consultation was less than 47 percent.

Puckett et al. (1978) Pharmacist counseling practices were studied at 95 Midwest pharmacies. Pharmacists in professional pharmacies offered voluntary counseling more often (54 percent of the time) than those in traditional and chain pharmacies (36 and 29 percent, respectively). Counseling included the use of written communication (including auxiliary labels).

Schering Laboratories (1979) Only 34 percent of patients surveyed reported that pharmacists were easy to approach with questions about prescriptions. The study revealed that patients want to know all about their prescriptions, but they may forget, or are too shy or embarrassed to ask.

Svarstad et al. (1979) 558 patients were observed at a hospital pharmacy. Fifty percent

received verbal consultation from a pharmacist.

Banahan et al. (1980) Representatives of 603 households were interviewed. Twenty-nine percent reported they had asked their pharmacist about the use of medications available without a prescription. Twenty-nine percent reported a pharmacist had told them about side effects of prescription medications.

Morris et al. (1980) Researchers presented prescriptions for conjugated estrogen tablets at 268 pharmacies in 20 large cities. Patient counseling was provided at 32 percent of the independent pharmacies and 21 percent of the chain/large volume pharmacies.

Ross et al. (1981) Pharmacist counseling practices were studied at 95 Kansas pharmacies. Pharmacists in professional pharmacies offered voluntary counseling more often (53 percent of the time) than those in traditional and chain pharmacies (28 and 12 percent, respectively). Counseling included the use of written communication (including auxiliary labels).

Morris (1982) A nationwide telephone survey of 1223 individuals investigated the receipt of information by patients regarding prescription drugs. Seventy-two percent of the respondents reported nothing was said to them at the pharmacy.

Kirking (1982) Counseling as perceived by pharmacists was assessed through a mail survey of 506 pharmacists. The pharmacists reported an average counseling rate on new prescriptions as 41.5 percent, and that an average of 67 percent of their counseling sessions were self-initiated. There was a positive correlation ($r = 0.49$) between those who counseled most and those most likely to initiate counseling themselves.

Carroll and Gagnon (1983) Fifty percent of 144 respondents to a mail survey reported they received no verbal consultation from their pharmacist.

Moore et al. (1983) Of 267 elderly subjects to a telephone survey, 75 percent reported that drug information was not provided at their pharmacy.

Pitting and Hammel (1983) Prescription orders for doxepin were presented at 52 pharmacies and prescription orders for potassium permanganate solution were presented at 32 pharmacies. For the doxepin prescriptions, consultation was received at 60 percent of the prescription pharmacies, 46 percent of the independent pharmacies, and 7 percent of the chain pharmacies. For the potassium permanganate prescriptions, consultation was received at 100 percent of the prescription pharmacies, 94 percent of the independent pharmacies, and 63 percent of the chain pharmacies.

Morris et al. (1984) A national telephone survey of 1104 adults who had recently obtained

a new prescription was conducted. Seventy percent of the respondents reportedly were not told how much of the medication to take, 74 percent were not told how often to take the medication, and 89 percent were not told about side effects at their pharmacy.

Mason and Svarstad (1984) A shopper technique was used at 40 rural pharmacies using either Actifed or tetracycline prescriptions. Some type of verbal instruction was provided in 70 percent of all encounters.

Smith and Sharpe (1984) Three hundred elderly people were interviewed. Only 20 percent reported they had talked with the pharmacist at the time their last prescription was dispensed.

Ascione et al. (1985) Results of a mail survey of 234 pharmacists showed that pharmacists reported they counsel an average of 52 percent of their patients receiving new prescriptions and 18 percent of their patients receiving renewed (refill) prescriptions.

Berardo (1985) Using behavioral observations of pharmacist - patient interactions, the percentage of patients who received some consultation during the pre-intervention period was 21.5 percent of 381 encounters. The mean number of seconds to consult with a patient was 36 seconds. After the intervention, 24.2 percent of the 954 encounters included consultation. The average consultation time increased to 43 seconds.

Morris et al. (1987b) Drug information seeking was investigated using data from a telephone survey of 835 individuals who had obtained new outpatient prescriptions within the previous four weeks. Forty percent were deemed "physician reliant," 19 percent "pharmacist reliant," seven percent "questioners," and 34 percent "uninformed."
National Association of Retail Druggists (1989) A survey of NARD members showed that 98 percent of the responding pharmacists reportedly counsel patients about their medications. In other words, two percent reportedly never counsel any patients.

Johnson & Johnson (1989) A survey of elderly Americans revealed that 32 percent received oral communication from their pharmacist all of the time, 26 percent most of the time, 22 percent some of the time, and 20 percent none of the time.

Wilson et al. (1989) In eight, three hour sessions, observations and recordings were made of advice-giving in two pharmacies. Fifty percent of 423 observed pharmaceutical transactions between pharmacist or assistant and patient were extended beyond basic administrative checks and sales information to include instructions, information, and advice.

Blom and Rens (1989) Observations were made of 105 OTCs purchased in a pharmacy. Based on observations, verbal information was given in 36 percent of the OTC purchases.

Upon interview, respondents reported verbal information was given in 30 percent of the OTC purchases.

Campbell, et al. (1989) A follow-up study of Campbell and Grisafe (1975) was conducted. In 100 percent of the cases, the pharmacist met with the patient (student), and in 80 percent of the cases the pharmacist explained the directions.

Gannon (1990) A mail survey of 601 individuals revealed that 41 percent reportedly received information about their last prescription in a verbal discussion with their pharmacist. On new prescriptions 38 percent reported their pharmacist always counsels, and on a renewal 13 percent reported their pharmacist always counsels.

Kusserow (1990) In a draft report on the clinical role of the community pharmacist Kusserow concluded, "given the relatively low level of services that are actually provided in community settings, there may be little difference in the interventions received by patients, and in some cases, the information provided by mail service pharmacy package inserts may be more than patients receive from their neighborhood pharmacist."

Meade (1992) Telephone interviews of 200 randomly selected chain and independent pharmacists who belonged to APhA's Academy of Pharmaceutical Practice and Management were conducted. Pharmacists reported they counsel six out of 10 patients and spend an average of 3.9 minutes each time they give a patient information about a prescription the patient has never taken before, and an average of 1.5 minutes counseling patients on refill prescriptions.

Wiederholt et al. (1992) Data were collected from 2135 randomly selected respondents through telephone interviews. Overall, 60 percent of the respondents reported receiving no consultation from pharmacy personnel. The status of the prescription (original or renewal) was the most important factor of those studied to help explain receipt of consultation from a pharmacist. Fifty-four percent of the respondents reported no consultation for an original prescription. Sixty-seven percent whose last prescription was a renewal reported receiving no consultation.

APPENDIX D

CONTEXTUAL CUES IN A PHARMACY ENVIRONMENT WHICH MAY AFFECT PHARMACIST - PATIENT COMMUNICATION

PHYSICAL EVIDENCE CONTEXTUAL CUES IN A PHARMACY ENVIRONMENT WHICH MAY AFFECT PHARMACIST - PATIENT COMMUNICATION

Consultation Area (Beardsley et al. 1977, Framm 1984, Ludy et al. 1977, Polanski and Polanski 1982, Schommer and Wiederholt 1992a)
Stationary Fixtures between Pharmacist and Patient (Chewning 1992, Gardner et al. 1991, Hammel 1989, Ranelli 1979, Schommer and Wiederholt 1992a)
Distance between Pharmacist and Patient (Hammel 1989, Kawahara 1991, Ranelli 1979)
Lighting (Kitching and Jones 1990, Polanski and Polanski 1982)
Height of Prescription Area Counter (Beardsley 1989)
Height of Prescription Area Platform (Beardsley 1989)
Physical Appearance of Pharmacy Practice Setting (Baldwin 1987, Kirking 1984, Ludy et al. 1977, Mackowiak and Manasse 1984)
Proportion of Pharmacy devoted to Prescription Department (Baldwin 1987, Beardsley 1989)

PROCESS CONTEXTUAL CUES IN A PHARMACY ENVIRONMENT WHICH MAY AFFECT PHARMACIST - PATIENT COMMUNICATION

Privacy (Altman and Vinsel 1977,Beardsley et al. 1977, Bergin 1990, Hall 1966, Polanski and Polanski 1982, Schommer and Wiederholt 1992a, Starr 1990)
Prescription Status (Schommer and Wiederholt 1992a, Wiederholt et al. 1992)
Type of Prescription (Kirking 1980, Pitting and Hammel 1983, Schommer and Wiederholt 1992a, Schondelmeyer and Trinca 1983)
Time (Hammel 1989, Kirking 1980, Mason 1982, Schommer and Wiederholt 1992a, Spencer 1974)
Number of Interchanges/Transfers of the Prescription which are not between the pharmacist and patient (Beardsley 1989)
Transfer of Prescription to the Patient (Beardsley 1989)
Noise (Kitching and Jones 1990, Polanski and Polanski 1982)

APPENDIX E

PHARMACIST CONSULTATION SURVEY

PHARMACIST CONSULTATION SURVEY

Please use about 15 minutes to complete this form by writing your responses in the appropriate spaces. This survey contains four parts. The first part asks you to rate how important you believe some elements of consultation are for a situation. Next, you will be asked about your experiences with consultation. The third part asks you about your role as a consultant. The last part asks you about yourself and your pharmacy practice for categorization purposes.

Part One: Elements of Consultation

Listed below is a situation a pharmacist may encounter. Assume that the information given is all you know about the patient. After reading the situation, please rate the importance for each element of consultation. Base your rating on what **you would say in this situation.** The rating scale is listed below (0 = Of No Importance through 10 = Of Great Importance). Write your answers in the space next to each element. Also, if you wish to make written comments, please do so in the space provided.

RATING SCALE

Of No Importance										Of Great Importance	Don't Know
0	1	2	3	4	5	6	7	8	9	10	11

SITUATION

A parent presents an Amoxicillin suspension prescription for her one-year-old child to you. The dosage and directions are appropriate for a one-year-old child. As the parent hands you the prescription she says this is her child's first ear infection and has no experience in using a prescription for a child's ear infection. The pediatrician has authorized one refill as needed for a subsequent ear infection. You have collected all pertinent patient profile information. The child has no known allergies.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

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RATING SCALE

Of No Importance										Of Great Importance		Don't Know
0	1	2	3	4	5	6	7	8	9	10		11

SITUATION

A parent presents an Amoxicillin suspension bottle to be refilled for her one-year-old child to you. She tells you that the pediatrician told her that her child may get ear infections periodically and to use the Amoxicillin exactly as the first time. The dosage and directions are appropriate for a one-year-old child. The pediatrician has authorized one refill as needed for a subsequent ear infection. You have collected all pertinent patient profile information. The child has no known allergies.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

PHARMACIST CONSULTATION SURVEY

Please use about 15 minutes to complete this form by writing your responses in the appropriate spaces. This survey contains four parts. The first part asks you to rate how important you believe some elements of consultation are for a situation. Next, you will be asked about your experiences with consultation. The third part asks you about your role as a consultant. The last part asks you about yourself and your pharmacy practice for categorization purposes.

Part One: Elements of Consultation

Listed below is a situation a pharmacist may encounter. Assume that the information given is all you know about the patient. After reading the situation, please rate the importance for each element of consultation. Base your rating on what you would say in this situation. The rating scale is listed below (0 = Of No Importance through 10 = Of Great Importance). Write your answers in the space next to each element. Also, if you wish to make written comment, please do so in the space provided.

RATING SCALE

Of No Importance										Of Great Importance		Don't Know
0	1	2	3	4	5	6	7	8	9	10		11

SITUATION

A 70-year-old female patient presents a new prescription for Feldene. The dosage and directions are appropriate. Her profile shows she has no known allergies and is taking no other medications.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

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RATING SCALE

Of No Importance										Of Great Importance	Don't Know
0	1	2	3	4	5	6	7	8	9	10	11

SITUATION

A 70-year-old female patient asks to purchase Advil; a medication she saw advertised on television. Her profile shows she has no known allergies and is taking no other medications.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

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RATING SCALE

Of No Importance										Of Great Importance	Don't Know
0	1	2	3	4	5	6	7	8	9	10	11

SITUATION

You are extremely busy. Ten people are waiting for their prescriptions and you are presented with a new prescription for aspirin in high dosage from Dr. Arthritis, a general practitioner. As you enter the prescription into the computer a warning flashes on the screen telling you that for the last three months the patient has been taking Warfarin prescribed by Dr. Thrombosis, a specialist.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

PHARMACIST CONSULTATION SURVEY

Please use about 15 minutes to complete this form by writing your responses in the appropriate spaces. This survey contains four parts. The first part asks you to rate how important you believe some elements of consultation are for a situation. Next, you will be asked about your experiences with consultation. The third part asks you about your role as a consultant. The last part asks you about yourself and your pharmacy practice for categorization purposes.

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RATING SCALE

Of No Importance										Of Great Importance	Don't Know
0	1	2	3	4	5	6	7	8	9	10	11

SITUATION

Business is slow. The only patient in the pharmacy is your next door neighbor who is picking up a refill he called in the day before. The prescription is for his blood pressure medication he has been taking with good results. After he takes his blood pressure on the machine located in your pharmacy, he says, "137/85, right on the money again" and then asks for his refill.

Please rate the importance for each element of consultation based on what you would say in this situation. Use the scale above.

Comments

___ 1. Name of medication and purpose.
___ 2. Directions for use and storage.
___ 3. Side effects.
___ 4. Interactions with other medications.
___ 5. Contraindications (Conditions under which the medication should not be taken.)
___ 6. Administrative (price, generic availability, refills)
___ 7. Continuity of therapy (How this medication works with others, what this medication replaces.)
___ 8. Monitoring (How to assess the medication's effectiveness, action to take if a problem occurs.)
___ 9. Other (specify)_____

Part Two: Your Experiences With Consultation

Please write your answer to each question in the space provided.

1. What criteria do you use to determine the amount and content of verbal consultation you give a patient? Please be specific and use examples if you wish.

2. For most patients you see in your practice, what do you believe is most important to give - verbal, written or both verbal and written consultation? Why?

3. In your pharmacy practice, what barriers make it more difficult to provide consultation to patients?

4. In your pharmacy practice, what factors make it easier to provide consultation to patients?

Part Three: Your Role As A Consultant

Now we want to obtain your opinion about your role as a consultant to patients. Based on your pharmacy practice experiences, please rate each statement with the following rating scale:

Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
1	2	3	4	5	6	7

Place the number of the rating scale in the space provided next to each statement.

__ 1. The physician is better qualified than the pharmacist to advise patients about their medications.
__ 2. It takes too much time to counsel patients on the medication they receive.
__ 3. Most patients are concerned about receiving quick and inexpensive service from their pharmacist rather than advice.
__ 4. It is essential for the pharmacist to advise patients about potential side effects that their drugs may cause.
__ 5. An affixed prescription label and applicable auxiliary labels contain all the information about the prescribed drug that the patient should receive from the pharmacist.
__ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription medication three times daily. The medication is expensive and the patient cannot afford to buy enough of the medication to take it three times daily. A much less expensive generic equivalent of the medication is available. There is a risk that by not taking the full dose three times daily the patient's condition will worsen. The risk can be avoided by using the less expensive equivalent generic product. Who should be responsible for counseling the patient that an affordable generic equivalent is available?

__ The pharmacist should be solely responsible..

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Three: Your Role As A Consultant

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Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
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Place the number of the rating scale in the space provided next to each statement.

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__ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription medication to prevent her blood from coagulating. The medication interacts with non-prescription drug products that contain aspirin to cause excess bleeding. There is a risk that the medication and an aspirin-containing product will cause excess bleeding if they are taken together. The risk can be avoided by not taking non-prescription products that contain aspirin. Who should be responsible for counseling the patient about which non-prescription products contain aspirin?

__ The pharmacist should be solely responsible.

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Three: Your Role As A Consultant

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Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
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Place the number of the rating scale in the space provided next to each statement.

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__ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription medication to treat a condition that flares up occasionally. It is important to always have a supply of medication on hand to treat the condition when it flares up. The medication is susceptible to deterioration, and there is a risk that it will not work well if it has been stored in places that are very hot or very moist, because this causes rapid deterioration. The risk can be avoided by storing the medication in a cool, dry place. Who should be responsible for counseling the patient about the need to store the medication in a cool, dry place?

__ The pharmacist should be solely responsible.

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Three: Your Role As A Consultant

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Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
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__ 2. It takes too much time to counsel patients on the medication they receive.
__ 3. Most patients are concerned about receiving quick and inexpensive service from their pharmacist rather than advice.
__ 4. It is essential for the pharmacist to advise patients about potential side effects that their drugs may cause.
__ 5. An affixed prescription label and applicable auxiliary labels contain all the information about the prescribed drug that the patient should receive from the pharmacist.
__ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription anti-inflammatory medication to treat minor back pain. Indomethacin is an effective drug for the patient's condition. There is a risk that patients who are allergic to aspirin will have an allergic reaction to indomethacin. This risk can be avoided by not using indomethacin. Who should be responsible for counseling the patient about the possibility of an allergic reaction to indomethacin if the patient is allergic to aspirin?

__ The pharmacist should be solely responsible.

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Three: Your Role As A Consultant

Now we want to obtain your opinion about your role as a consultant to patients. Based on your pharmacy practice experiences, please rate each statement with the following rating scale:

Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
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__ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription medication to treat migraine headaches. The medication is safe if its use is limited, but there is a risk of harm if the medication is used too often. This risk can be avoided by limiting medication use to specific levels. Who should be responsible for counseling the patient about the limits on safe drug use?

__ The pharmacist should be solely responsible.

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Three: Your Role As A Consultant

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Very Strongly Disagree	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Very Strongly Agree
1	2	3	4	5	6	7

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__ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
__ 8. Patients receive the necessary information about their medications from their physician.

After reading the situation below, check the response which most closely reflects your opinion about who should be responsible for the task given in the situation (only check one response).

A patient needs a prescription antibiotic medication to treat a stubborn infection. There is a risk that the antibiotic will cause partial hearing loss. This risk can be avoided by not using the antibiotic. Who should be responsible for counseling the patient about the possibility of partial hearing loss?

__ The pharmacist should be solely responsible.

__ The pharmacist should be primarily responsible, but the physician should also be responsible.

__ The pharmacist and the physician should share the responsibility equally.

__ The physician should be primarily responsible, but the pharmacist should also be responsible.

__ The physician should be solely responsible.

Comments: _____

_____

Part Four: Characteristics of Yourself and Your Pharmacy Practice

Now, some questions about yourself and your practice will help us analyze the results of this study. Please check or write in your answer.

1. What is the type of your practice setting?
   ___ Community pharmacy (independent/small chain)
   ___ Chain pharmacy (> 10 units)
   ___ Hospital/Long-Term Care
   ___ Clinic
   ___ Other (Specify)_____

2. What is your position at your practice setting?
   ___ Owner/manager/director
   ___ Assistant manager or director
   ___ Chief pharmacist
   ___ Staff pharmacist
   ___ Intern
   ___ Other (Specify)_____

3. Age: _____ Years

4. Number of total years practicing as a pharmacist: _____ Years

5. What is your pharmacy's average daily prescription volume?
   ___ 0-75
   ___ 76-150
   ___ 151-225
   ___ 226-300
   ___ more than 300

6. Estimate the percentage of the average daily prescription volume that are refill prescriptions: ___ Percent

7. How many pharmacists are employed at your pharmacy
   ___ full time (> 30 hours per week)?
   ___ part time?

8. Are pharmacy technicians employed at your pharmacy?
   ___ Yes
   ___ No

9. Estimate the percentage of patients who obtain prescriptions at your pharmacy who are over the age of 55?
   ___ Percent

Your comments or suggestions about this survey are welcome.

_____

_____

_____

_____

_____

APPENDIX F

ITEMS USED TO MEASURE PHARMACIST COUNSELOR ROLE ORIENTATION (CRO)

ITEMS USED TO MEASURE PHARMACIST COUNSELOR ROLE ORIENTATION (CRO)

PHARMACIST COUNSELOR ROLE ORIENTATION (Beardsley 1989, Carrol and Gagnon 1984, Kirking 1984, Mason 1979, Mason and Svarstad 1984, Schommer and Wiederholt 1992a, Smith 1990, Yellin and Norwood 1974, Zelnio et al. 1984)

For each statement below, write in the number which most closely reflects your agreement/disagreement with the following statements. Use the numbers:

1 = Very Strongly Disagree
2 = Strongly Disagree
3 = Disagree
4 = Uncertain
5 = Agree
6 = Strongly Agree
7 = Very Strongly Agree

RC = reverse coded

___ 1. The physician is better qualified than the pharmacist to advise patients about their medications. (RC)

___ 2. It takes too much time to counsel patients on the medication they receive. (RC)
___ 3. Most patients are more interested in receiving quick and inexpensive service from their pharmacist rather than advice. (RC)

___ 4. It is essential for the pharmacist to advise patients about potential side effects that their drugs may cause.

___ 5. An affixed prescription label and applicable auxiliary labels contain all the information about the prescribed drug that the patient should receive from the pharmacist. (RC)

___ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications. (RC)

___ 7. It is unethical to discuss with a patient the therapeutic purpose of his or her prescriptions. (RC)

___ 8. Patients receive the necessary information about their medications from their physician. (RC)

APPENDIX G

ITEMS USED TO MEASURE PATIENT COUNSELEE ROLE ORIENTATION (PRO)

ITEMS USED TO MEASURE PATIENT COUNSELEE ROLE ORIENTATION (PRO)

PATIENT COUNSELEE ROLE ORIENTATION

For each statement below, write in the number which most closely reflects your agreement/disagreement with the following statements. Use the numbers:

1 = Very Strongly Disagree
2 = Strongly Disagree
3 = Disagree
4 = Uncertain
5 = Agree
6 = Strongly Agree
7 = Very Strongly Agree

RC = reverse coded

___ 1. My physician is better qualified than the pharmacist to advise me about my medications. (RC)

___ 2. It takes too much time to talk with the pharmacist about the medication I receive. (RC)

___ 3. I am more interested in receiving quick and inexpensive service from the pharmacist rather than advice. (RC)

___ 4. It is essential for the pharmacist to advise me about potential side effects that my drugs may cause.

___ 5. An attached prescription label and other stickers put on the prescription bottle contain all the information about the prescribed drug that I should receive from the pharmacist. (RC)

___ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications. (RC)

___ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions. (RC)

___ 8. I receive the necessary information about my medications from my physician. (RC)

APPENDIX H

ITEMS USED TO MEASURE CONTEXTUAL CUES

ITEMS USED TO MEASURE CONTEXTUAL CUES

LACK OF TIME (Hammel 1989, Kirking 1980, Mason 1982, Schommer and Wiederholt 1992a, Spencer 1974)

Number of other patients (customers) waiting to approach the prescription counter:

___ patients

Number of interruptions outside the pharmacist - patient dyad that the pharmacist encountered while the patient is waiting for the prescription(s) to be dispensed (e.g. phone calls, other patients, personnel initiated questions, compounding requirements).

___ interruptions

Perceived Time Pressure (Pharmacist)

The pharmacist was asked once per hour, "About how busy have you been during the last hour?"

1 2 3 4 5 6 7

Not Busy At All Extremely Busy

Perceived Time Pressure (Patient)

Each patient was asked, "About how busy would you say the pharmacist was when you arrived at the pharmacy?"

1 2 3 4 5 6 7

Not Busy At All Extremely Busy

LACK OF PRIVACY (Altman and Vinsel 1977, Beardsley et al. 1977, Bergin 1990, Hall 1966, Polanski and Polanski 1982, Schommer and Wiederholt 1992a, Starr 1990)

Number of people (other than the pharmacist, patient, people who accompanied the patient, and observer) within the prescription department at the time the patient receives the prescription(s) who are:

Less than four feet from the patient (Personal Distance) _____ people x 3

From four feet to 12 feet from the patient (Social Distance) _____ people x 2

More than 12 feet to 25 feet from the patient (Public Distance) _____ people x 1

TOTAL _____

Note: The observer was more than 25 feet from the patient or out of view at all times it was possible.

Patient's perception of the amount of privacy (Reverse Coded)

Each patient was asked, "For today's pharmacy visit only, how would you rate the amount of privacy you had for confidential communication with your pharmacist?"

1 2 3 4 5 6 7

Extremely Unprivate — Extremely Private

PRESCRIPTION TRANSFER (Beardsley 1989)

The pharmacist transferred the completed prescription to the patient:

___ YES ___ NO

IMPORTANCE OF INFORMATION (Kirking 1980, Pitting and Hammel 1983, Schommer and Wiederholt 1992a, Schondelmeyer and Trinca 1983)

For each prescription dispensed, the name of medication and directions for use was collected. Also, the original/renewal status was determined and coded as:

1 = renewal (refill), and have been taking it for more than one year.
2 = at least the second renewal (refill), but have taken it for less than one year.
3 = first renewal (refill)
4 = uncertain
5 = original (new) prescription, but have had it before.
6 = original (new) prescription, and never had it before.
7 = more than one original (new) prescription.

Each patient was asked to rate the importance of communicating with the pharmacist at that pharmacy visit using the scale below. Then, each dispensing pharmacist independently rated the importance of communicating information about the medication for the patient using the following scale:

1 2 3 4 5 6 7

Of No Importance Of Great Importance

APPENDIX I

ITEMS USED TO MEASURE CONTENT OF PHARMACIST - PATIENT COMMUNICATION

ITEMS USED TO MEASURE CONTENT OF
PHARMACIST - PATIENT COMMUNICATION

(Curtin 1987, Mason 1979, National Association of Boards of Pharmacy 1990)

___ Name of Medication (brand or generic name)

___ Purpose of Medication (what the medication is for)

___ Directions for use (how to use the medication)

___ Side Effects (side effects which may occur)

___ Interactions with other medications (interactions which may occur)

___ Contraindications (conditions under which the medication should not be taken)

___ Administrative (price, generic availability, renewals)

___ Continuity of therapy (how this medication works with others, what it replaces)

___ Monitoring (how to assess the medication's effectiveness, action to take if problem occurs)

___ Solicitation of feedback (pharmacist asks patient for feedback)

___ Patient question asking (patient asks pharmacist an unsolicited question)

___ Other _____
(specify)

APPENDIX J

ITEMS USED TO MEASURE PATIENT SATISFACTION/DISSATISFACTION WITH PHARMACIST - PATIENT COMMUNICATION

ITEMS USED TO MEASURE PATIENT SATISFACTION/DISSATISFACTION WITH PHARMACIST - PATIENT COMMUNICATION

(Curtin 1987)

Each patient was asked, "How do you rate the amount and content of communication you had with your pharmacist today?"

1 2 3 4 5 6 7

Extremely Not Valuable — Extremely Valuable

1 2 3 4 5 6 7

Extremely Not Useful — Extremely Useful

1 2 3 4 5 6 7

Extremely Not Satisfying — Extremely Satisfying

APPENDIX K

LETTER AND SUMMARY OF DATA COLLECTION PROCEDURES FOR THIS STUDY SENT TO PARTICIPATING PHARMACISTS

Dear XXXXXXX,

Thank you for your willingness to participate in the research I am conducting for my dissertation. Enclosed is a copy of data collection procedures I will use in your pharmacy.

The data collection forms and procedures will be pretested in May. After the necessary changes are made, I will contact you to set up the best time for me to visit your pharmacy to arrange data collection procedures. Data collection will require about two days, depending on the number of patients who will be willing to participate in an interview.

If you have any questions or suggestions please call me. My phone number at the School of Pharmacy is (608) 262-6534 and at home is (608) 233-1572.

I am extremely grateful for your help in my research. I have been studying the area of pharmacist - patient communication and designing this study for about three years. To know pharmacists who are interested in this topic and willing to let me observe their pharmacy practice is absolutely thrilling. I look forward to working with you and believe your participation in this study will have a positive impact on pharmacy practice.

Sincerely,

Jon C. Schommer, RPh
Doctoral Candidate
Pharmacy Administration

enclosure

cc: Joseph B. Wiederholt

SUMMARY OF PROPOSED DATA COLLECTION PROCEDURES FOR: THE ROLE OF CONTEXTUAL CUES IN PHARMACIST - PATIENT COMMUNICATION

Research conducted by:

Jon C. Schommer, M.S., Doctoral Candidate

Advised by Joseph B. Wiederholt, Ph.D., Associate Professor

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The purpose of this study is to investigate the role of "contextual cues" in the occurrence of pharmacist - patient communication in community pharmacies, while also considering pharmacist and patient variables. Data will be collected at about 12 community pharmacies in Wisconsin through observation, patient interviews, and pharmacist interviews. The pharmacies are located throughout Wisconsin and include various types of community practice settings.

OBSERVATION

Randomly selected interactions between volunteer pharmacists and patients will be observed unobtrusively. One researcher (Jon Schommer) will be present in the pharmacy, but at a distance of about 25 feet from the prescription counter. A total of 30 usable observations are required at each pharmacy. Using the estimate of two observations per hour, about 15 hours (2-3 days) will be needed to complete data collection at each pharmacy. About once per hour, the volunteer pharmacist will be asked, "About how busy have you been during the last hour?" Otherwise, the researcher will not interfere or interrupt pharmacy personnel or patients during observations.

PATIENT INTERVIEWS

After a patient is observed, he or she will be asked to participate in this study upon exiting the pharmacy area. The interviewer will introduce himself as a student from the University of Wisconsin - Madison. Patients may refuse to participate. Patients who do participate will be interviewed for about 3-5 minutes.

PHARMACIST INTERVIEWS

After all 30 of the observations and patient interviews are completed at a pharmacy site, the pharmacist volunteer for the pharmacy will be asked to answer eight questions and to rate 30 different prescription regimens using 7-point scales. Ideally, the pharmacist will be interviewed at the end of the day or during a break just before the researcher leaves that pharmacy site. In total, each pharmacist interview may take about 10-15 minutes.

TIMETABLE

Data collection procedures were pretested May 7-11, 1992. After the pretest, minor changes were made in the data collection forms and procedures. Now, dates and times are being arranged with each volunteer pharmacist for data collection at their pharmacies. Data collection has begun and will continue through about June 30, 1992.

SUMMARY

In summary, what is required of each volunteer pharmacist is: (1) the willingness to participate, (2) arrange times for the researcher to visit the pharmacy during his or her hours of work, (3) answer the "time" question about once per hour, and (4) answer a total of 38 questions at the conclusion of data collection at his or her pharmacy.

We assure that patient confidentiality, pharmacist confidentiality, and pharmacy confidentiality will be maintained. However, when the sample of pharmacies used for this study is described, pharmacies may be identified as, for example, "Pharmacy A, a low volume pharmacy, located in urban, southeastern Wisconsin." No real names of pharmacies will be used.

In appreciation for each pharmacist's participation, a summary of the results for his or her pharmacy can be prepared for him or her upon request. Also, a copy of the final form of the dissertation prepared from these data will be given to each pharmacist volunteer.

Thank you very much for your help in this research project. We look forward to working with you.

APPENDIX L

OBSERVATION DATA COLLECTION FORM

OBSERVATION DATA COLLECTION FORM

Pharmacy _____ Encounter Number ____
Date _____
Time of Day _____
Comments (e.g. patient gender) _____

LACK OF TIME
Number of other patients (customers) waiting to approach the prescription counter:

_____ patients

Number of interruptions outside the pharmacist-patient dyad that the pharmacist encountered while the patient is waiting for the prescription(s) to be dispensed (e.g. phone calls, other patients, personnel initiated questions, and compounding requirements).

_____ interruptions

Perceived Time Pressure

The pharmacist will be asked once per hour, "About how busy have you been during the last hour?"

	1	2	3	4	5	6	7	
Not Busy At All								Extremely Busy

LACK OF PRIVACY
Number of people (other than the pharmacist, patient, people who accompanied the patient, and observer) within the prescription department at the time the patient receives a prescription(s) who are:

Less than four feet from the patient (Personal Distance)	____ people x 3
From four feet to 12 feet from the patient (Social Distance)	____ people x 2
more than 12 feet up to 25 feet from the patient (Public Distance)	____ people x 1
TOTAL	____

Note: The observer will be more than 25 feet from the patient or out of view at all times it is possible.

PRESCRIPTION TRANSFER

The pharmacist transferred the completed prescription to the patient

___ YES ___ NO

PHARMACIST - PATIENT COMMUNICATION

Occurrence of Pharmacist-Patient Communication

___ YES ___ NO

Length of Communication _____ seconds

Content of Communication

___ Name of Medication (brand or generic name)

___ Purpose of Medication (what the medication is for)

___ Directions for use (how to use the medication)

___ Side Effects (side effects which may occur)

___ Interactions with other medications (interactions which may occur)

___ Contraindications (conditions under which the medication should not be taken)

___ Administrative (price, generic availability, renewals)

___ Continuity of therapy (how this medication works with others, what it replaces)

___ Monitoring (how to assess the medication's effectiveness, action to take if problem occurs)

___ Solicitation of feedback (pharmacist asks patient for feedback)

___ Patient question asking (patient asks pharmacist an unsolicited question)

___ Other _____
(specify)

___ TOTAL

APPENDIX M

PHARMACIST INTERVIEW DATA COLLECTION FORM

PHARMACIST INTERVIEW DATA COLLECTION FORM

For each statement below, write in the number which most closely reflects your agreement/disagreement with the following statements. Use the numbers:

1 = Very Strongly Disagree
2 = Strongly Disagree
3 = Disagree
4 = Uncertain
5 = Agree
6 = Strongly Agree
7 = Very Strongly Agree

___ 1. The physician is better qualified than the pharmacist to advise patients about their medications.

___ 2. It takes too much time to counsel patients on the medication they receive.

___ 3. Most patients are more interested in receiving quick and inexpensive service from their pharmacist rather than advice.

___ 4. It is essential for the pharmacist to advise patients about potential side effects that their drugs may cause.

___ 5. An affixed prescription label and applicable auxiliary labels contain all the information about the prescribed drug that the patient should receive from the pharmacist.

___ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.

___ 7. It is unethical to discuss with a patient the therapeutic purpose of his or her prescriptions.

___ 8. Patients receive the necessary information about their medications from their physician.

For each situation below, rate the importance of verbally communicating information about the medication to the patient for that particular situation using the following scale:

1 2 3 4 5 6 7

Of No Importance Of Great Importance

Base your answers on how important you believe verbally communicating with the patient would be if you encountered that dispensing situation. For each case, assume the patient (or agent of the patient) is in the pharmacy.

Comments

1. _____ ____

2. _____ ____

3. _____ ____

4. _____ ____

5. _____ ____

6. _____ ____

7. _____ ____

8. _____ ____

9. _____ ____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

21. _____

22. _____

23. _____

24. _____ ____

25. _____ ____

26. _____ ____

27. _____ ____

28. _____ ____

29. _____ ____

30. _____ ____

COMMENTS:

_____
_____
_____
_____
_____
_____
_____
_____
_____

After you have completed this form, please return it to the researcher.

THANK YOU FOR YOUR HELP!

APPENDIX N

PATIENT INTERVIEW DATA COLLECTION FORM

PATIENT INTERVIEW DATA COLLECTION FORM

Pharmacy _____ Encounter Number ___
Date _____
Time of Day _____

Hello, my name is Jon Schommer. I am a student from the University of Wisconsin in Madison and am conducting a study about how communication between pharmacists and patients can be improved. The pharmacist knows I am conducting this survey. It will take about 5 minutes to complete and your answers will remain anonymous and confidential.

First, I want to ask your opinions on talking with your pharmacist about medications.

Please respond to the following statements by rating your agreement or disagreement based on your feelings as you **entered** the pharmacy today. Please write the number of your response in the spaces provided. Use the rating:

1 = very strongly disagree
2 = strongly disagree
3 = disagree
4 = uncertain
5 = agree
6 = strongly agree
7 = very strongly agree.

___ 1. My physician is better qualified than the pharmacist to advise me about my medications.
___ 2. It takes too much time to talk with the pharmacist about the medication I receive.
___ 3. I am more interested in receiving quick and inexpensive service from the pharmacist rather than advice.
___ 4. It is essential for the pharmacist to advise me about potential side effects that my drugs may cause.
___ 5. An attached prescription label and other stickers put on the prescription bottle contain all the information about the prescribed drug that I should receive from the pharmacist.
___ 6. There should be legal restrictions on what the pharmacist is allowed to tell patients about their medications.
___ 7. It is unethical for the pharmacist to discuss with a patient the therapeutic purpose of his or her prescriptions.
___ 8. I receive the necessary information about my medications from my physician.

Next, I'd like to ask some questions about your visit to the pharmacy **today**. Base your responses only on today's pharmacy visit. Please check or circle your response.

1. Was the amount of communication you had with your pharmacist **today**:
(check one)

___ less than you expected?
___ about what you expected?
___ more than you expected?

2. For today's pharmacy visit only, how would you rate the amount of privacy you had for confidential communication with your pharmacist? Please circle your answer.

	1	2	3	4	5	6	7	
Extremely Unprivate								Extremely Private

3. About how busy would you say the pharmacist was when you arrived at the pharmacy?

	1	2	3	4	5	6	7	
Not Busy At All								Extremely busy

4. How do you rate the communication you had with your pharmacist today?

	1	2	3	4	5	6	7	
Extremely Not Valuable								Extremely Valuable

	1	2	3	4	5	6	7	
Extremely Not Useful								Extremely Useful

	1	2	3	4	5	6	7	
Extremely Not Satisfying								Extremely Satisfying

5. When you arrived at the pharmacy today, how important to you was communicating with the pharmacist on this visit? (circle your response)

	1	2	3	4	5	6	7	
Of No Importance								Of Great Importance

6. How well do you know the pharmacist who dispensed your prescription today?

	1	2	3	4	5	6	7	
Not At All								Extremely Well

Now, I want to ask you about your experience with the medication you received today since researchers have found that the amount of experience you have had with your medication may determine the amount and content of communication you have with your pharmacist.

1. What are the name and directions of the prescription(s) you received today?

_____
_____
_____
_____

For each prescription medication you wrote for question 1 above, please code each prescription with one of the descriptions below:

1 = renewal (refill), and have been taking it for more than one year.
2 = at least the second renewal (refill), but have taken it for less than one year.
3 = first renewal (refill)
4 = uncertain
5 = original (new) prescription, but have had it before.
6 = original (new) prescription, and never had it before.
7 = more than one original (new) prescription.

Finally, what is your age? _____

Comments:

_____
_____
_____

THANK YOU VERY MUCH FOR PARTICIPATING IN THIS STUDY.

APPENDIX O

RESPONSE CARDS USED FOR PATIENT INTERVIEWS

RESPONSE CARDS USED FOR PATIENT INTERVIEWS

[1]

1 = VERY STRONGLY DISAGREE

2 = STRONGLY DISAGREE

3 = DISAGREE

4 = UNCERTAIN

5 = AGREE

6 = STRONGLY AGREE

7 = VERY STRONGLY AGREE

[2]

	1	2	3	4	5	6	7
EXTREMELY UNPRIVATE							EXTREMELY PRIVATE

[3]

	1	2	3	4	5	6	7
NOT BUSY AT ALL							EXTREMELY BUSY

[4]

	1	2	3	4	5	6	7
EXTREMELY NOT VALUABLE							EXTREMELY VALUABLE

[5]

	1	2	3	4	5	6	7
EXTREMELY NOT USEFUL							EXTREMELY USEFUL

[6]

	1	2	3	4	5	6	7
EXTREMELY NOT SATISFYING							EXTREMELY SATISFYING

[7]

	1	2	3	4	5	6	7
OF NO IMPORTANCE							OF GREAT IMPORTANCE

[8]

	1	2	3	4	5	6	7
NOT AT ALL							EXTREMELY WELL

APPENDIX P

DATA CODING FORMAT

DATA CODING FORMAT

DESCRIPTION OF ITEM AND CODING RANGE*	COLUMN POSITION	VARIABLE CODE
(From Observation Data Collection Form)		
Encounter identification number (001-360)	1-3	IDNUM
Pharmacy identification (01-12)	4-5	PHARMACY
Number of other patients ... (00-06)	6-7	OTHERPT
Number of interruptions... (00-05)	8-9	INTERUPT
Pharmacist's perceived time pressure (1-7)	10	RPHTIME
Less than four feet from the patient... (0-3)	11	PRIV1
From four feet to 12 feet from the patient... (0-4)	12	PRIV2
More than 12 feet up to 25 feet... (0-6)	13	PRIV3
Total Lack of Privacy Score (00-19)	14-15	TOTALPRI
Prescription Transfer (1=Yes,0=No)	16	RXTRANS
Occurrence of Communication (1=Yes,0=No)	17	COMM
Length of Communication (000-689)	18-20	LENGTH
Name of Medication (1=Yes,0=No)	21	NAME
Purpose of Medication (1=Yes,0=No)	22	PURPOSE
Directions for Use (1=Yes,0=No)	23	DIRECT
Side Effects (1=Yes,0=No)	24	SE
Interactions with Other Medications (1=Yes,0=No)	25	INTERACT
Contraindications (1=Yes,0=No)	26	CONTRA
Administrative (1=Yes,0=No)	27	ADMIN
Continuity of Therapy (1=Yes,0=No)	28	CONTIN
Monitoring (1=Yes,0=No)	29	MONITOR
Solicitation of Feedback (1=Yes,0=No)	30	SOLICIT
Patient Question Asking (1=Yes,0=No)	31	PTQUEST
Other, first listed (1=Yes,0=No)	32	OTHER1
Other, second listed (1=Yes,0=No)	33	OTHER2
Other, third listed (1=Yes,0=No)	34	OTHER3
Total Content of Communication (00-12)	35-36	TOTALCON

* Missing data were coded using 9, 99, or 999 where applicable.

DESCRIPTION OF ITEM AND CODING RANGE*	COLUMN POSITION	VARIABLE CODE
(From Patient Interview Data Collection Form)		
My physician is better qualified... (1-7)	37	PRO1
It takes too much time... (1-7)	38	PRO2
I am more interested in ... (1-7)	39	PRO3
It is essential for the pharmacists... (1-7)	40	PRO4
An attached prescription label... (1-7)	41	PRO5
There should be legal restrictions... (1-7)	42	PRO6
It is unethical for the pharmacist... (1-7)	43	PRO7
I receive the necessary information... (1-7)	44	PRO8
Was the amount... (1=less,2=about,3=more)	45	EXPECT
Patient's perceived privacy (1-7)	46	PTPRIV
Patient's perceived time pressure (1-7)	47	PTTIME
How valuable communication was (1-7)	48	VALUABLE
How useful communication was (1-7)	49	USEFUL
How satisfying communication was (1-7)	50	SATISFY
Patient's, importance of communication (1-7)	51	PTIMPT
How well do you know the pharmacist... (1-7)	52	KNOWRPH
Patient experience with medication [1 = renewal (refill) and have been taking it for more than one year, through 7 = more than one original (new) prescription]	53	NEWREF
Patient age (16-92)	54-55	AGE
(From Pharmacist Interview Data Collection Form)		
Pharmacist identification number (01-23)	56-57	RPH
Pharmacist CRO (sum of first eight questions on pharmacist interview form, with all but question 4 reverse coded)	58-59	CRO
Pharmacist's importance of communication (1-7)	60	RPHIMPT

* Missing data were coded using 9, 99, or 999 where applicable.

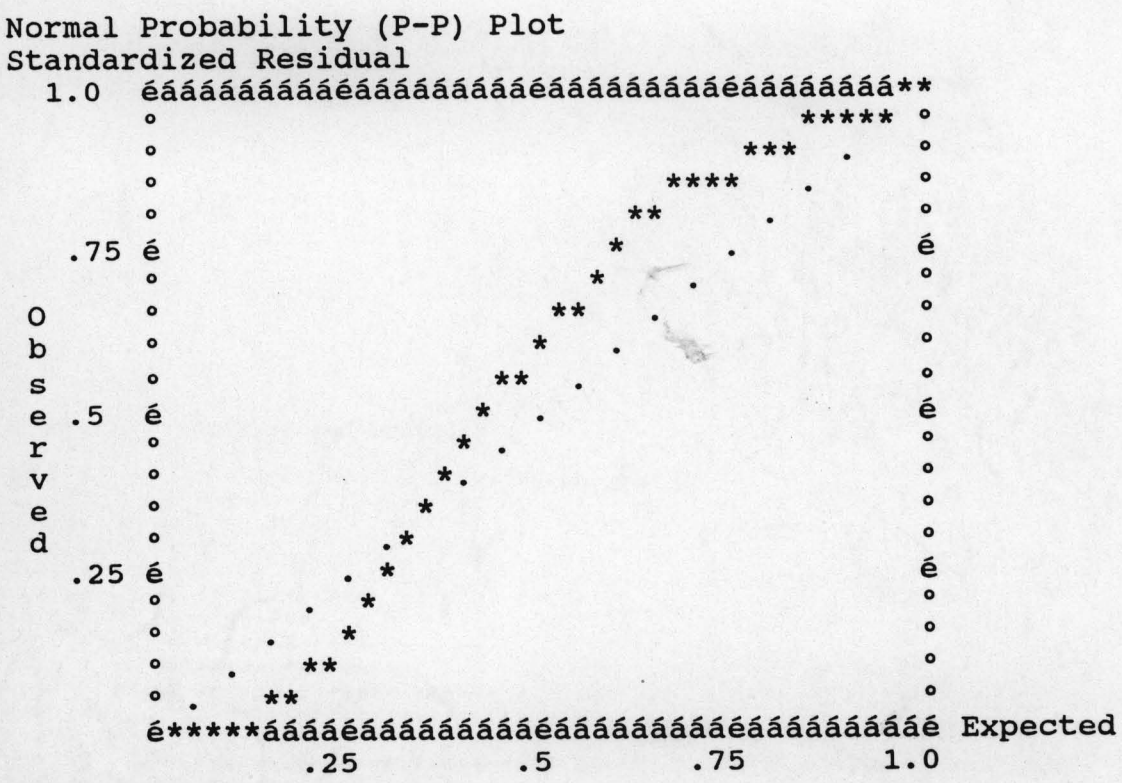
APPENDIX Q

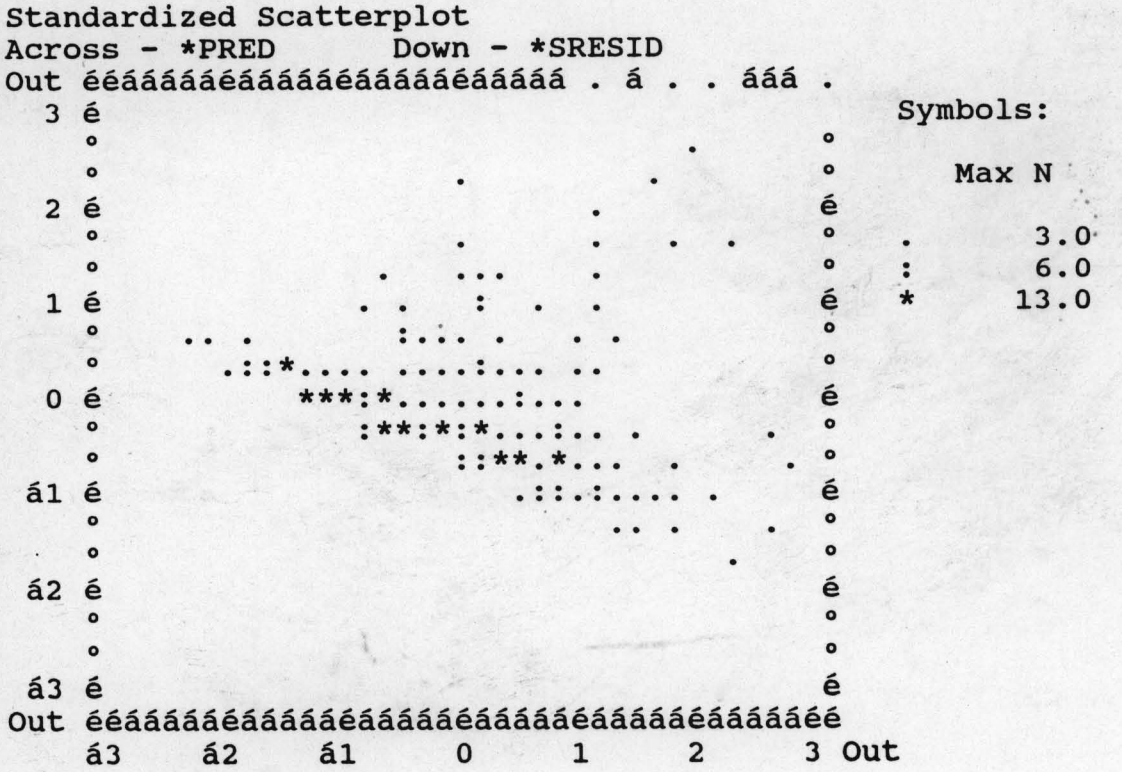
RESIDUAL ANALYSIS PLOTS

LENGTH OF COMMUNICATION (UNTRANSFORMED)
(ALL CASES)

Histogram - Standardized Residual

```
NExp N       (* = 2 Cases,     . : = Normal Curve)
4   .23    Out **
0   .46   3.00
1  1.18   2.67 :
2  2.69   2.33 :
1  5.49   2.00 * .
4  10.1   1.67 **  .
8  16.5   1.33 ****   .
*  24.3   1.00 *****      .
*  32.0    .67 ********        .
*  37.7    .33 ********************:****
*  39.8    .00 ********************:**********
*  37.7   -.33 ********************:**********
*  32.0   -.67 ***************:**********
*  24.3  -1.00 ********** .
5  16.5  -1.33 ***    .
0  10.1  -1.67     .
0  5.49  -2.00   .
0  2.69  -2.33 .
0  1.18  -2.67 .
0   .46  -3.00
0   .23    Out
```

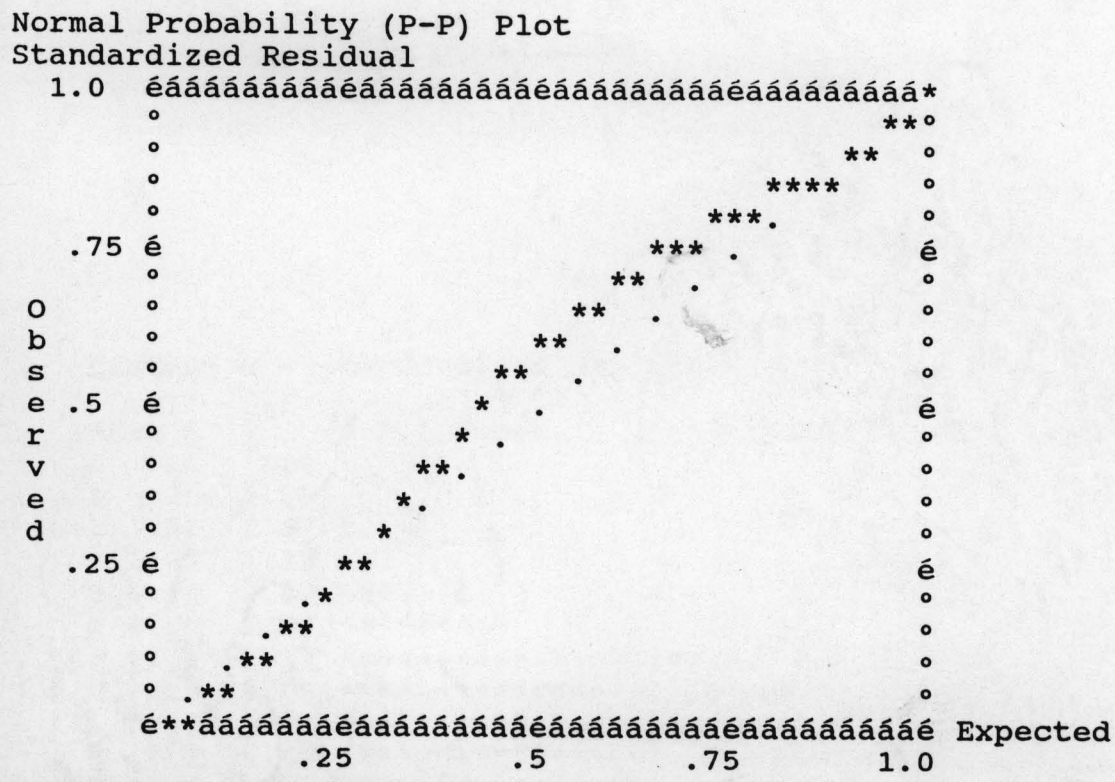

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
Expected

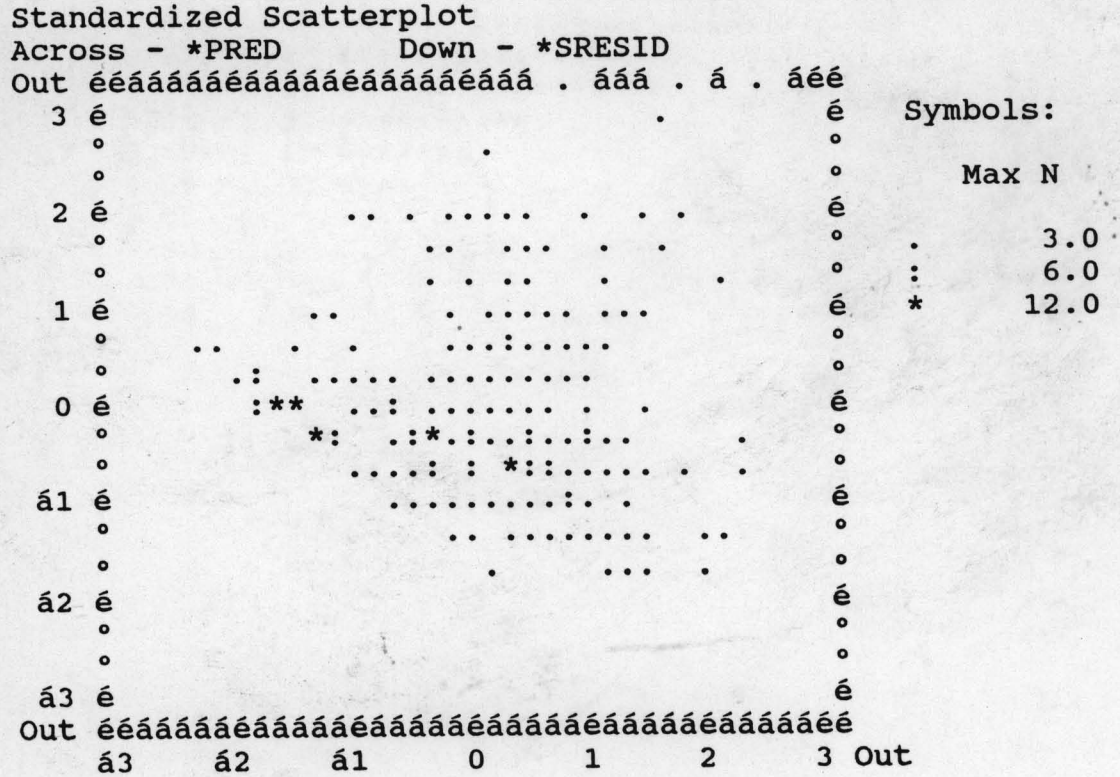

Standardized Scatterplot
Across - *PRED
Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Symbols:
Max N
3.0
6.0
13.0

SQUARE ROOT OF LENGTH OF COMMUNICATION
(ALL CASES)

```
Histogram - Standardized Residual

NExp N      (* = 1 Cases,     . : = Normal Curve)
3   .23    Out ***
1   .46   3.00 *
1  1.18   2.67 :
0  2.69   2.33   .
*  5.49   2.00 ****:*******
8 10.1    1.67 ******** .
*  16.5   1.33 ************    .
*  24.3   1.00 ***************          .
*  32.0    .67 ***********************          .
*  37.7    .33 ****************************             .
*  39.8    .00 ****************************************:******
*  37.7   -.33 ****************************************:**********************
*  32.0   -.67 ******************************:*************
*  24.3  -1.00 ************************:**
*  16.5  -1.33 ****************.
8  10.1  -1.67 ******** .
0  5.49  -2.00      .
0  2.69  -2.33    .
0  1.18  -2.67 .
0   .46  -3.00
0   .23    Out
```

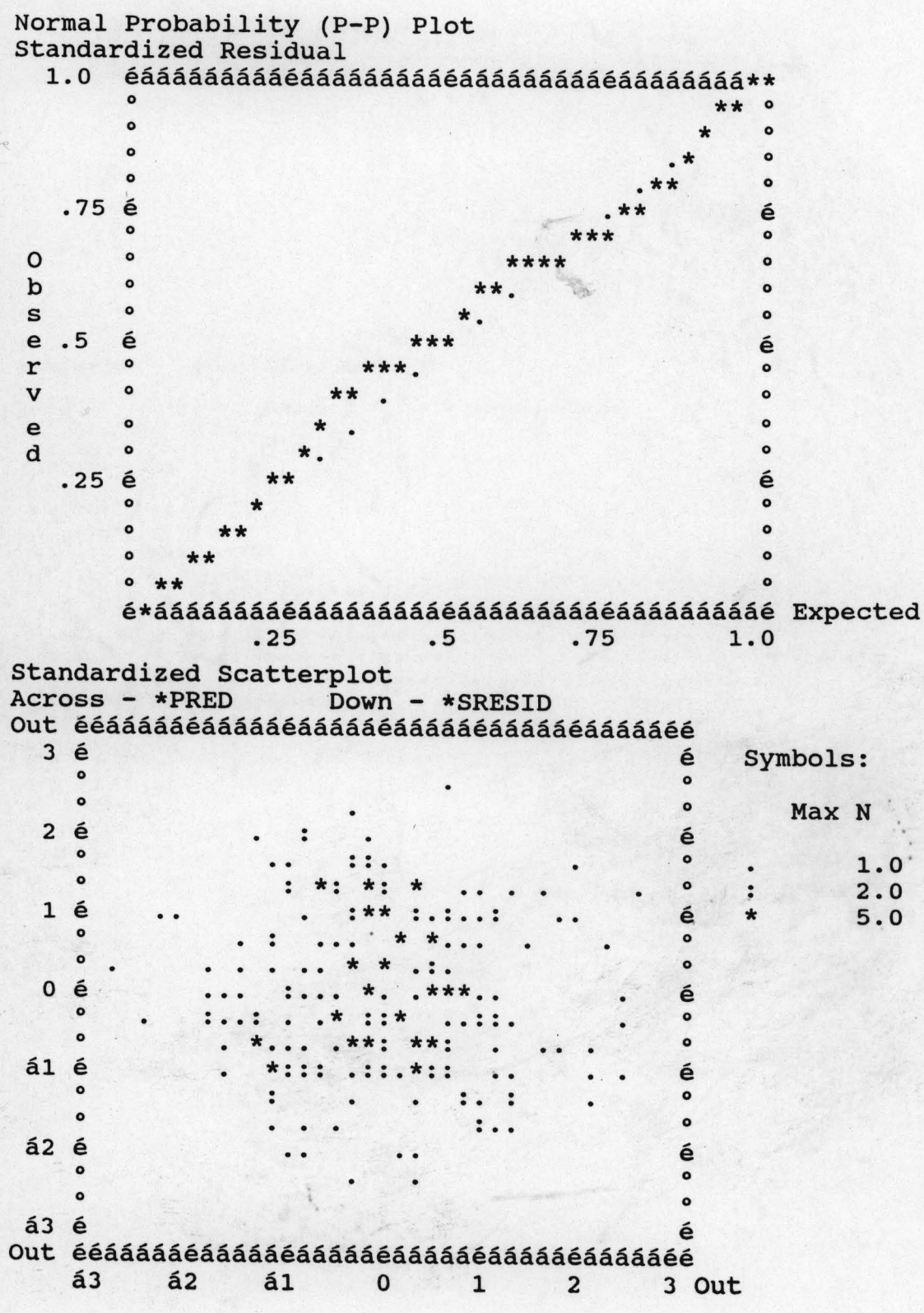

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3 á2 á1 0 1 2 3 Out
Symbols:
Max N
. 3.0
: 6.0
* 12.0

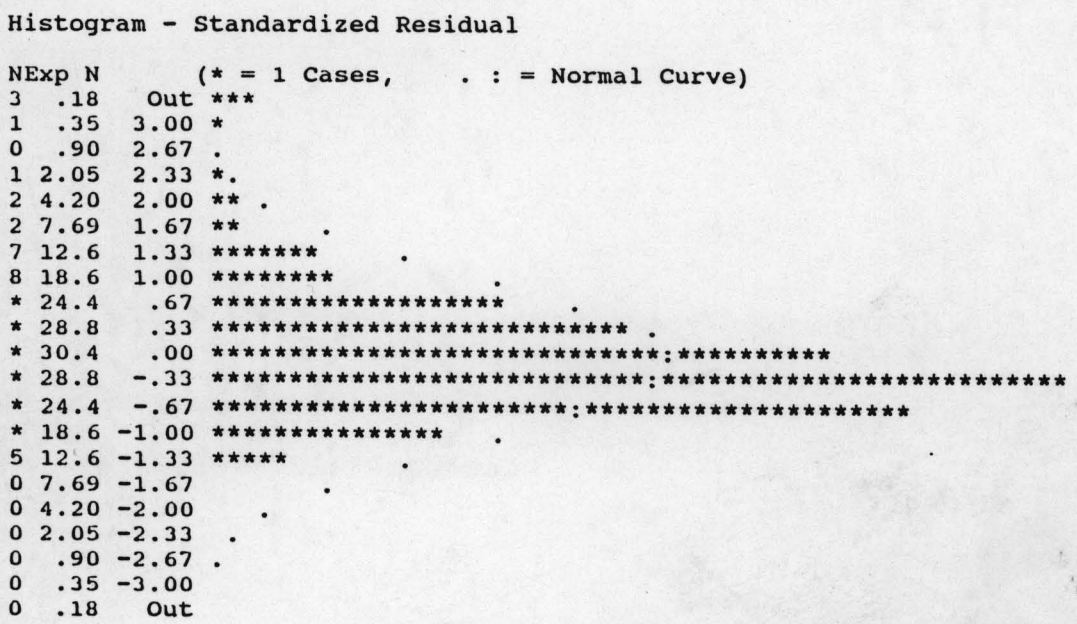
NATURAL LOG OF LENGTH OF COMMUNICATION
(ALL CASES)

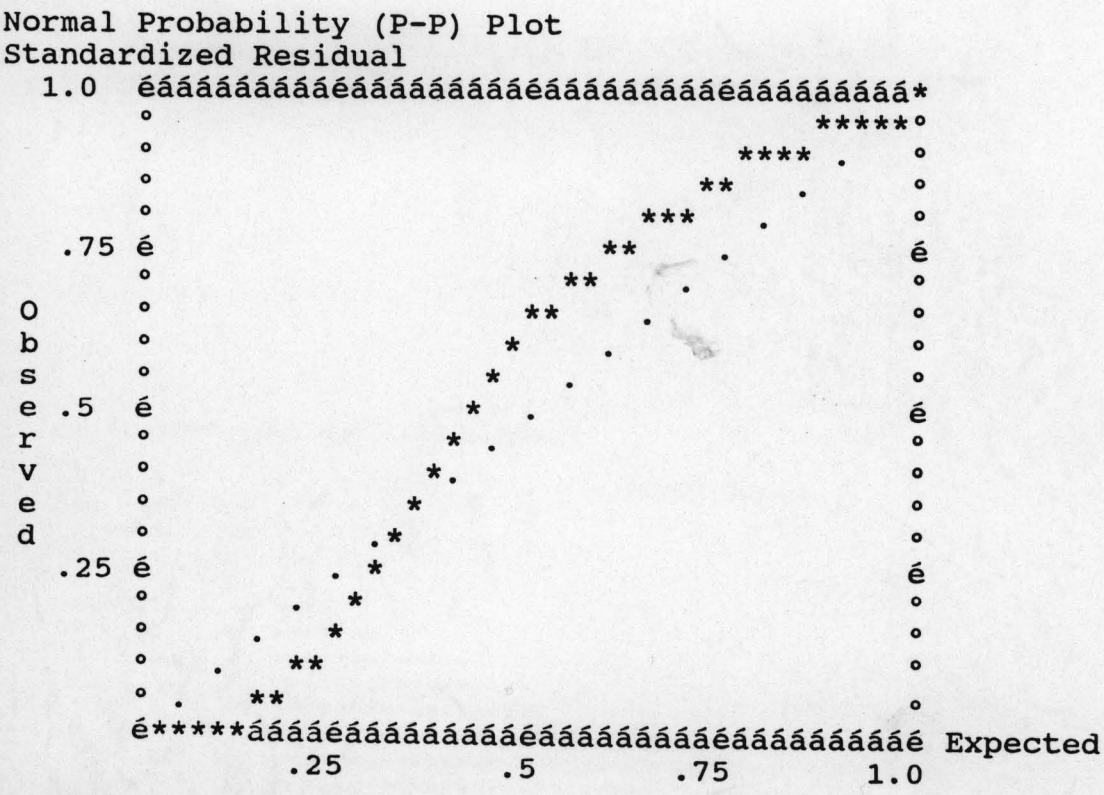
```
Histogram - Standardized Residual

NExp N       (* = 1 Cases,     . : = Normal Curve)
0  .18   Out
0  .35  3.00
1  .90  2.67 :
0 2.05  2.33  .
3 4.20  2.00 ***.
9 7.69  1.67 *******:*
* 12.6  1.33 ************:*********
* 18.6  1.00 ******************:*****
* 24.4   .67 *****************      .
* 28.8   .33 *****************          .
* 30.4   .00 ****************************  .
* 28.8  -.33 ****************************:
* 24.4  -.67 ************************:*******
* 18.6 -1.00 ******************:********
* 12.6 -1.33 **********  .
7 7.69 -1.67 *******.
4 4.20 -2.00 ***:
2 2.05 -2.33 *:
0  .90 -2.67 .
0  .35 -3.00
0  .18   Out
```


Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
Expected
Standardized Scatterplot
Across - *PRED
Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Symbols:
Max N
1.0
2.0
5.0

LENGTH OF COMMUNICATION (UNTRANSFORMED) (CASES FOR WHICH COMMUNICATION OCCURRED)

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Standardized Residual
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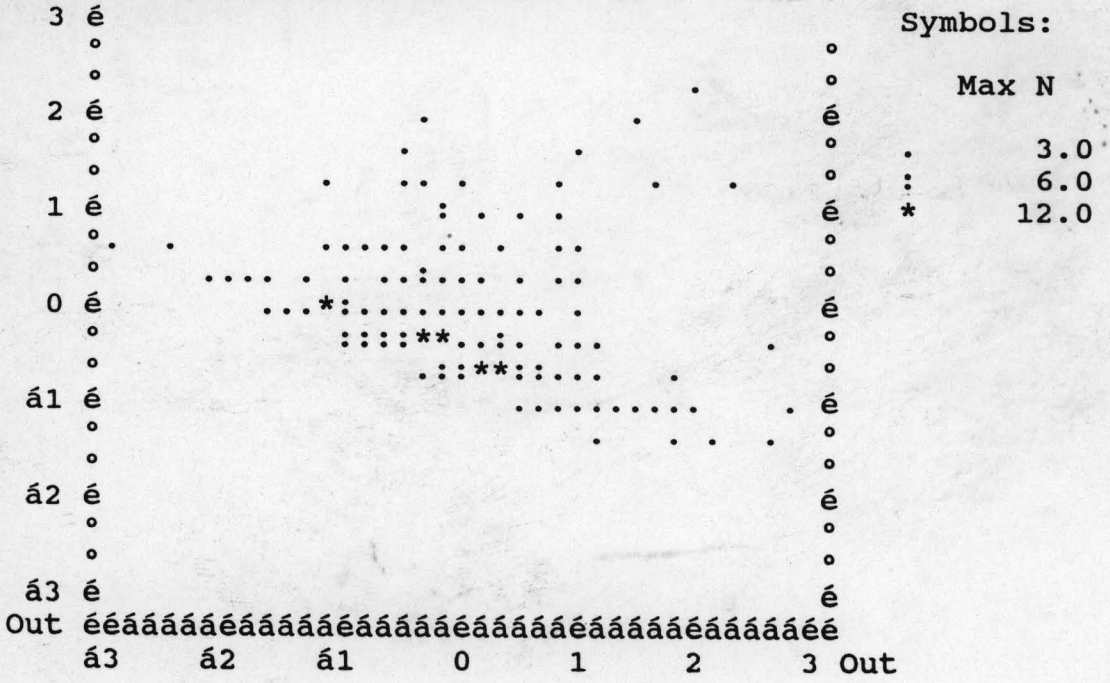
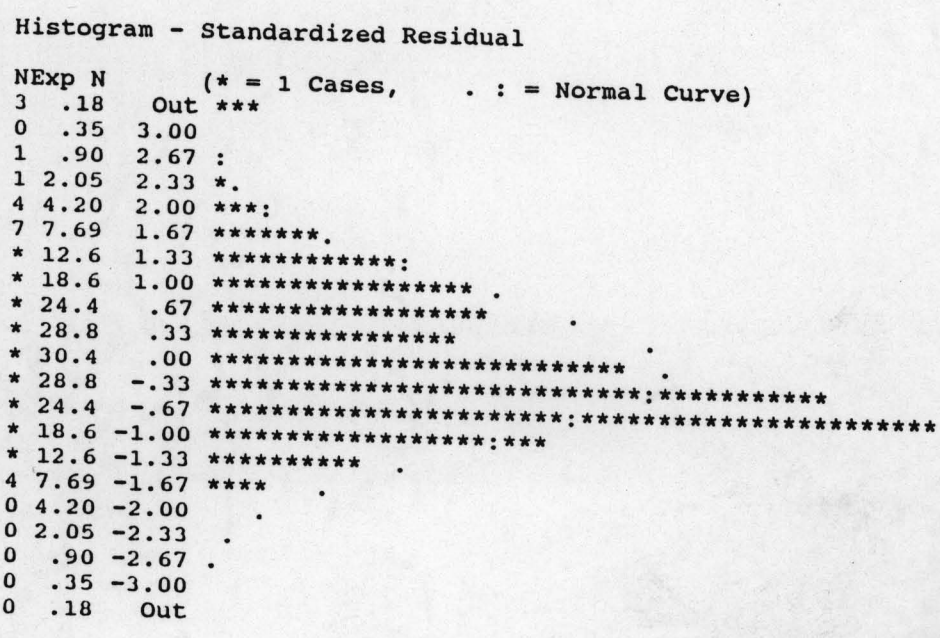
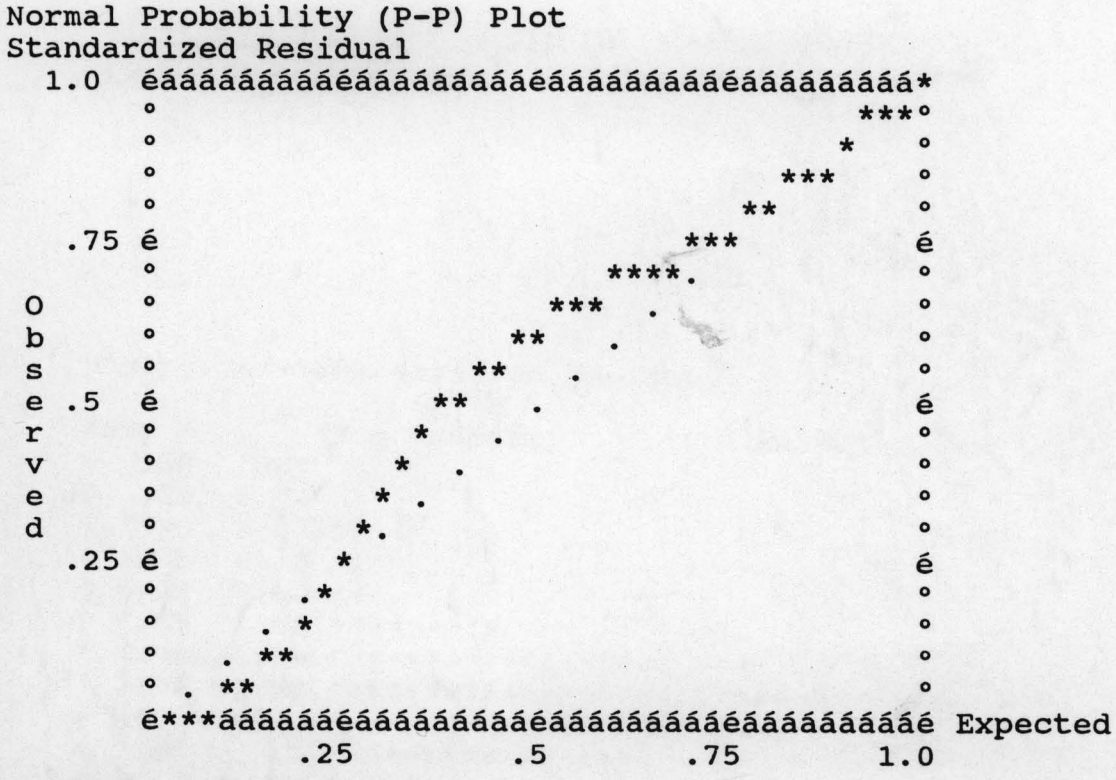
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
Symbols:
Max N
3.0
6.0
12.0
á3 á2 á1 0 1 2 3 Out

SQUARE ROOT OF LENGTH OF COMMUNICATION (CASES FOR WHICH COMMUNICATION OCCURRED)

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Standardized Residual
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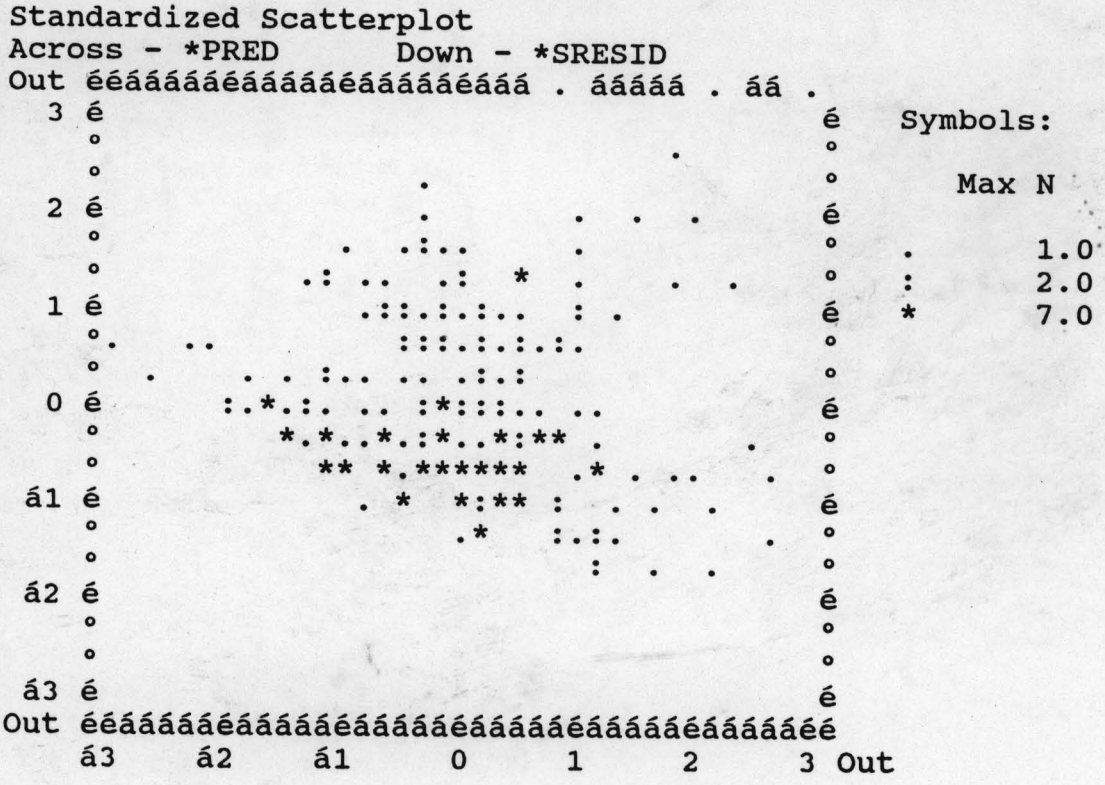
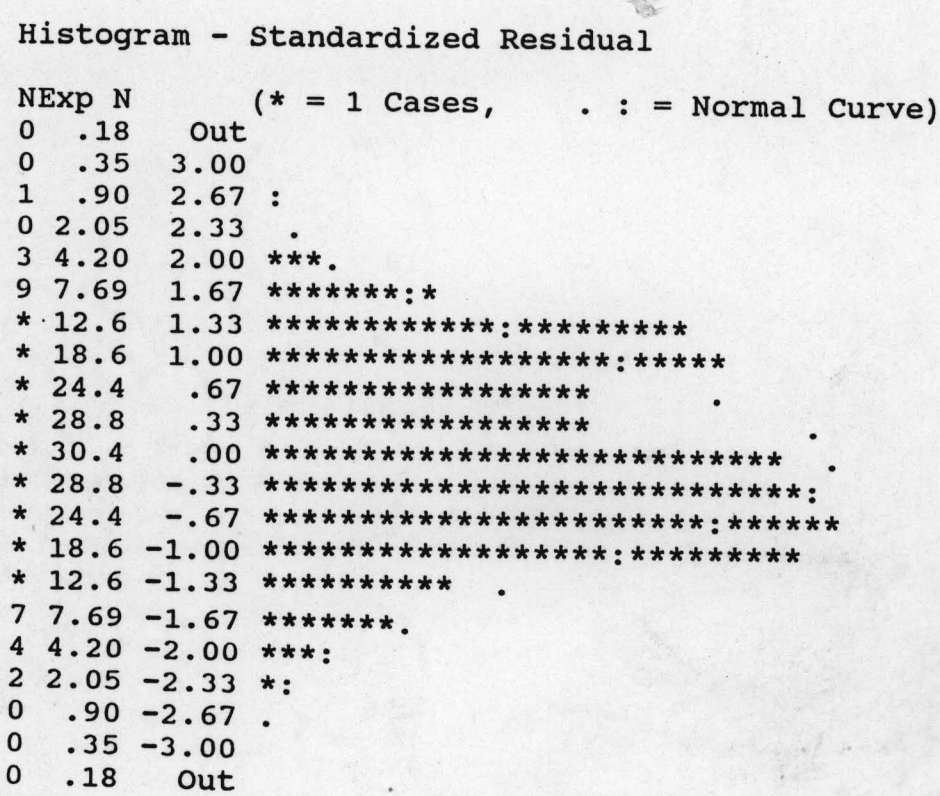
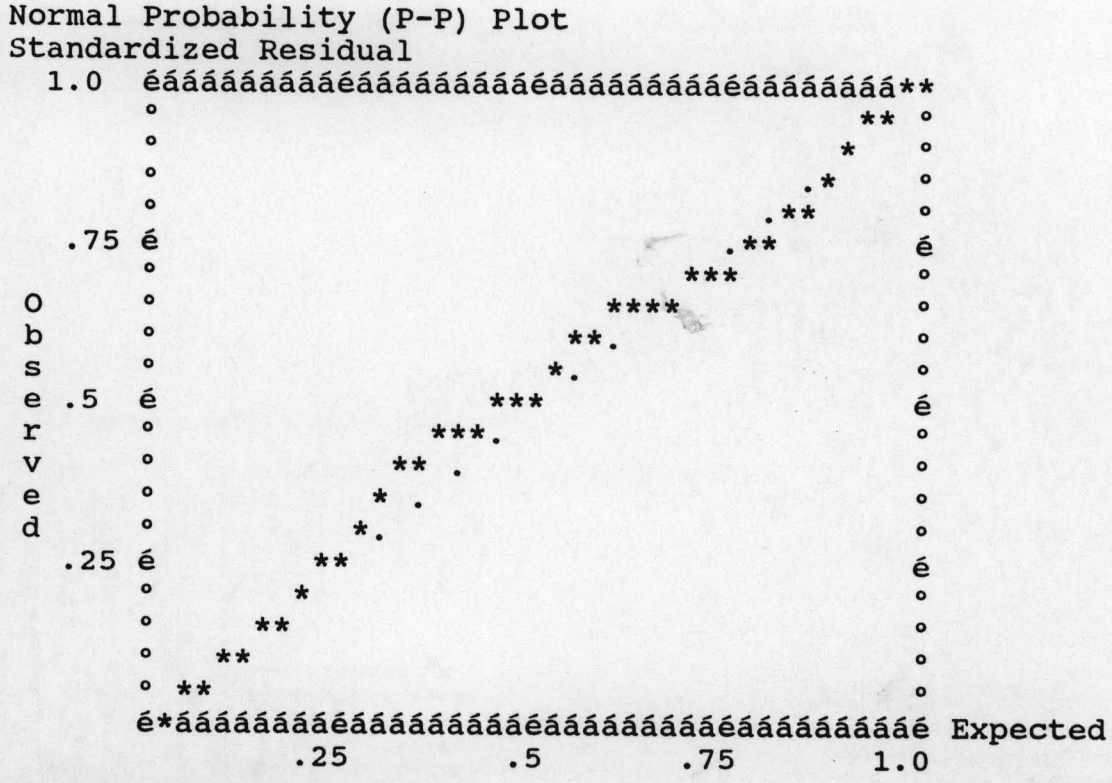
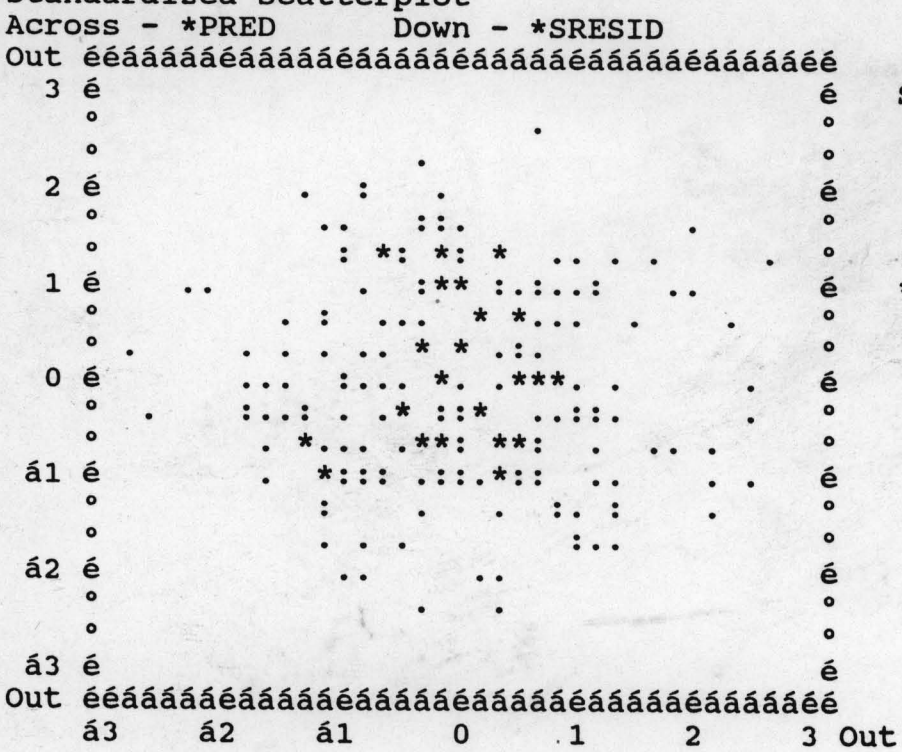
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
Symbols:
Max N
. 1.0
: 2.0
* 7.0
á3 á2 á1 0 1 2 3 Out

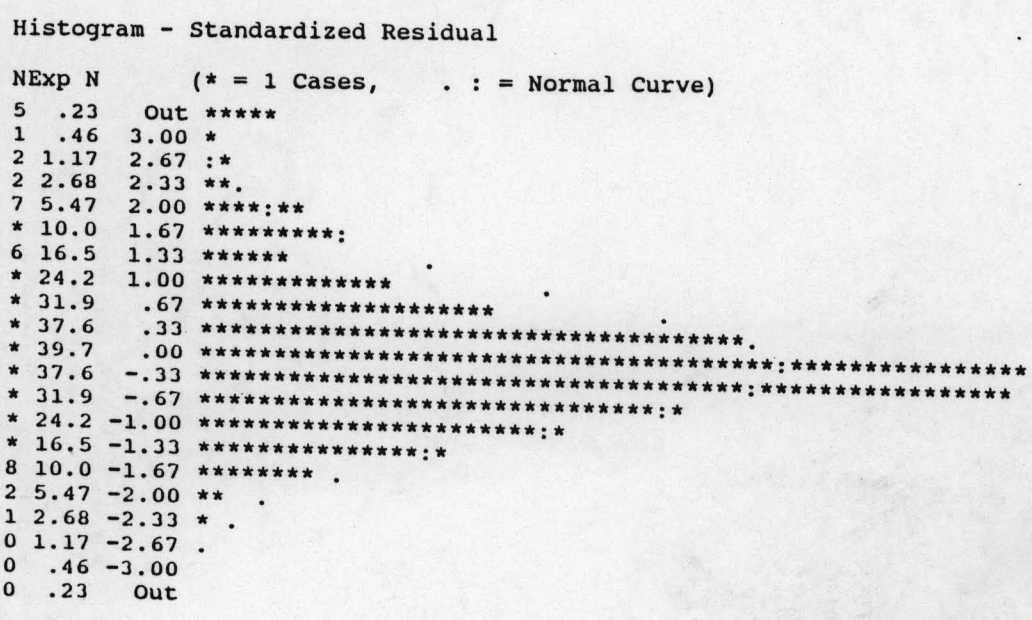
NATURAL LOG OF LENGTH OF COMMUNICATION
(CASES FOR WHICH COMMUNICATION OCCURRED)

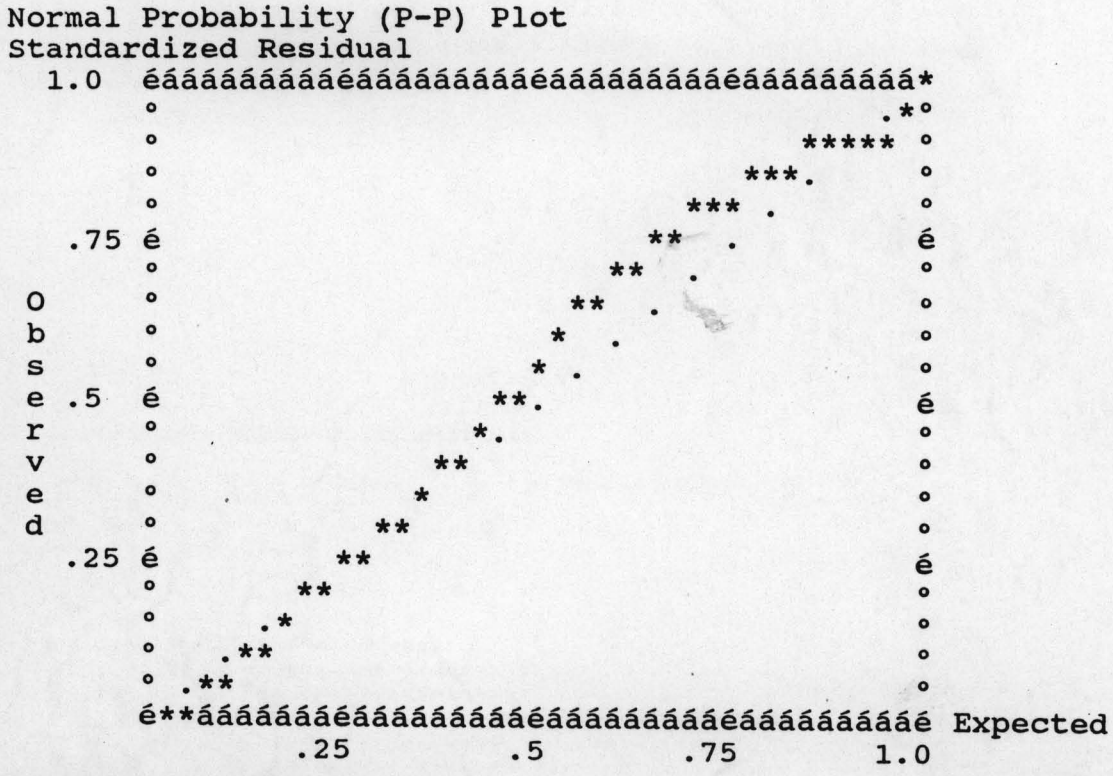


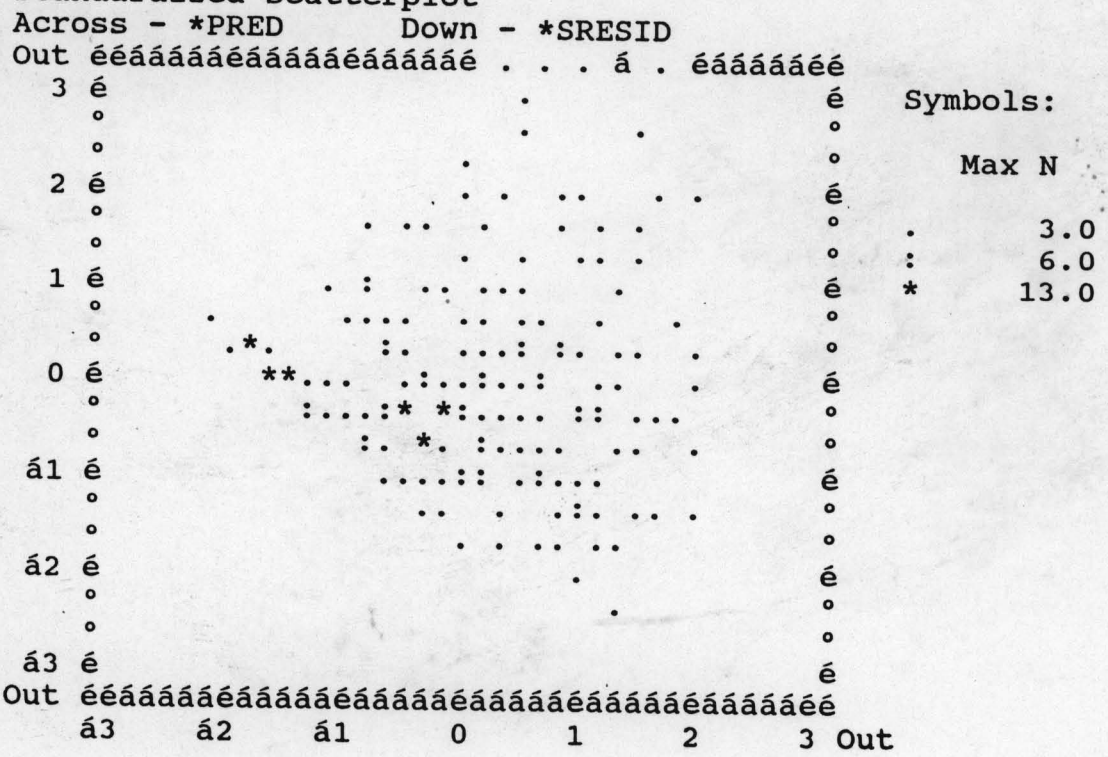

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3 á2 á1 0 1 2 3 Out
Symbols:
Max N
. 1.0
: 2.0
* 5.0

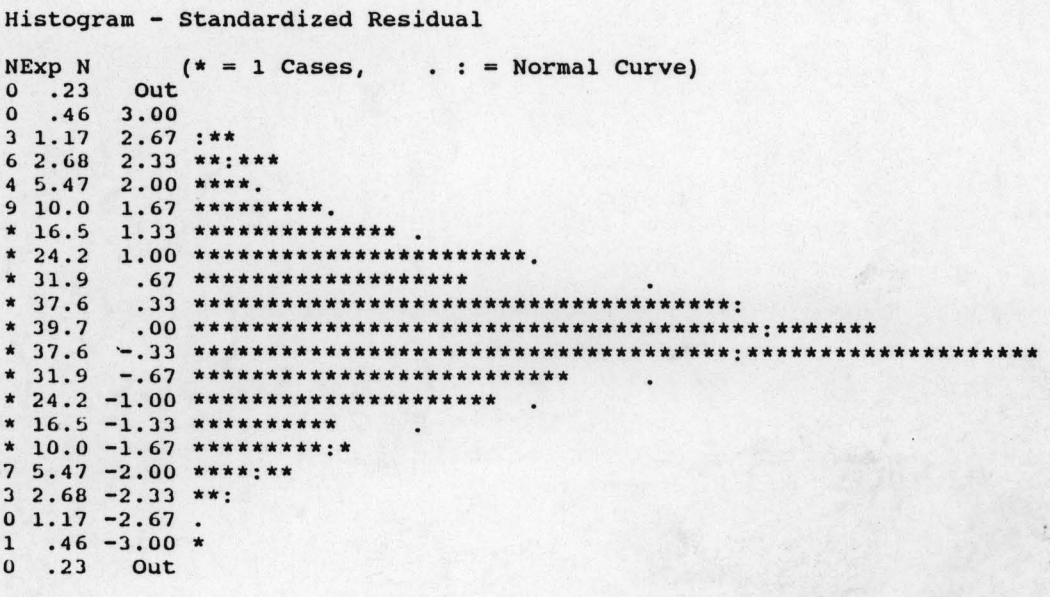
CONTENT OF COMMUNICATION (UNTRANSFORMED)
(ALL CASES)

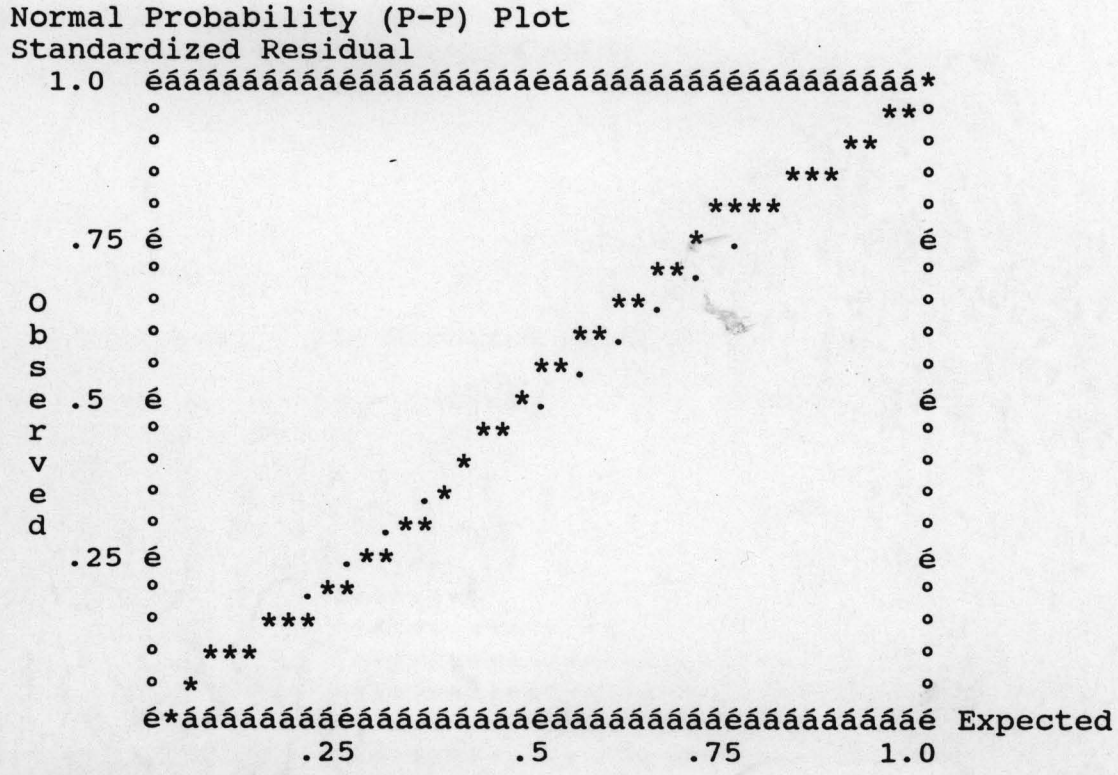


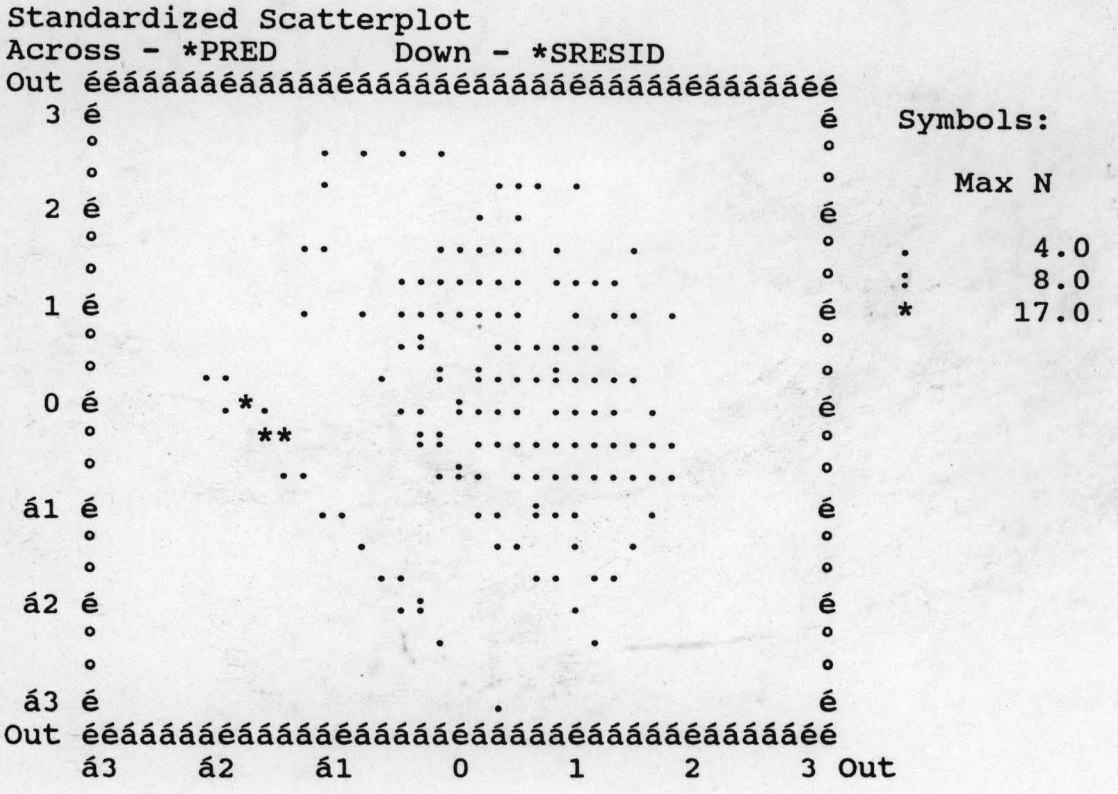

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED
Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3
á2
á1
0
1
2
3 Out
Symbols:
Max N
. 3.0
: 6.0
* 13.0

SQUARE ROOT OF CONTENT OF COMMUNICATION
(ALL CASES)



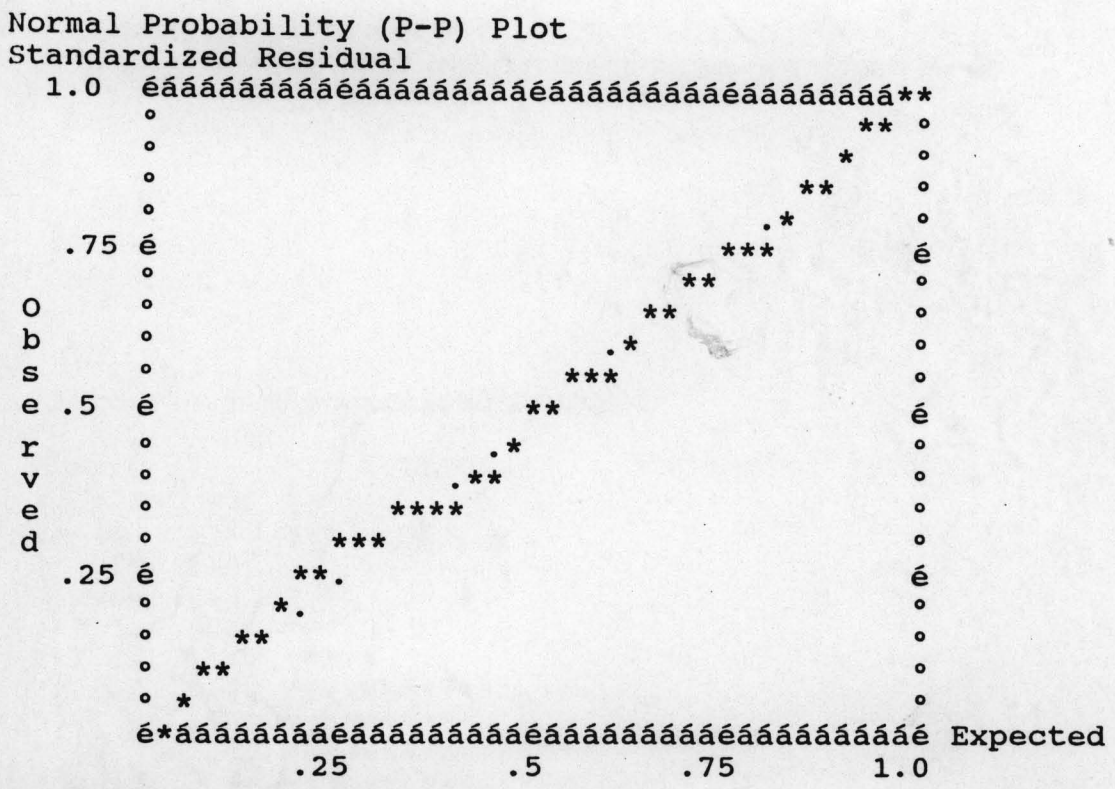

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
Expected
.25
.5
.75
1.0

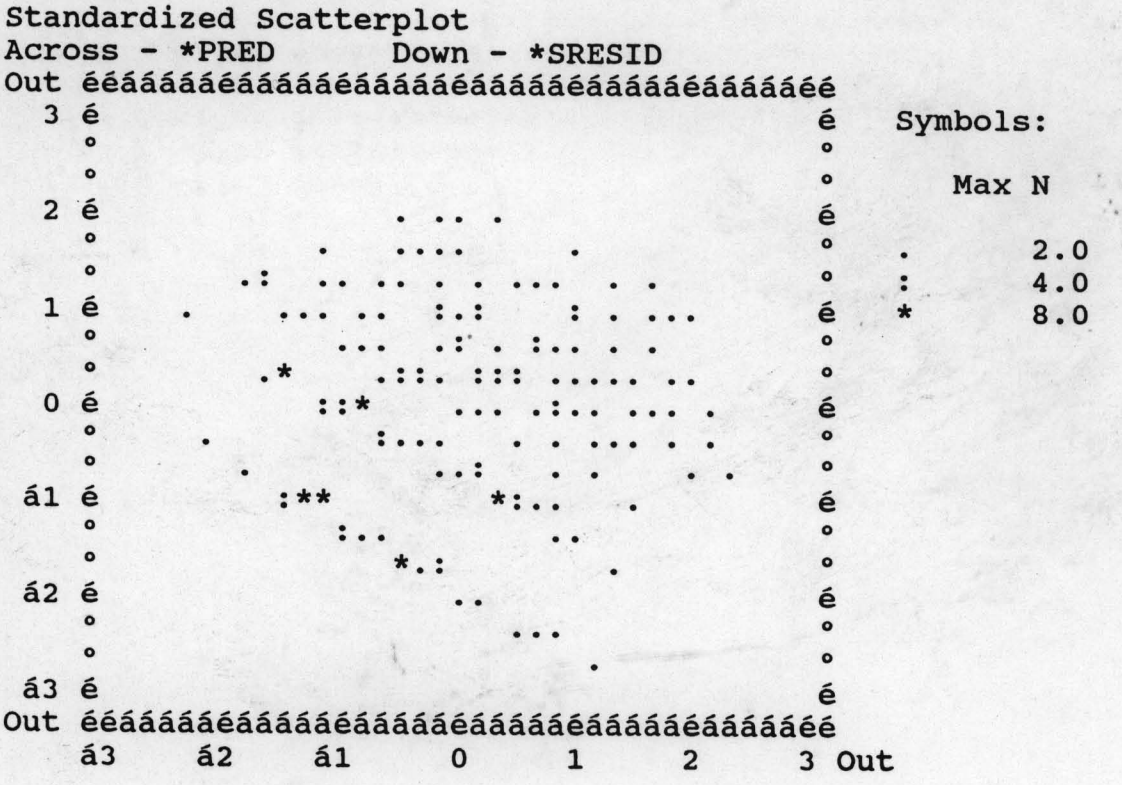

Standardized Scatterplot
Across - *PRED
Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Symbols:
Max N
. 4.0
: 8.0
* 17.0
á3 á2 á1 0 1 2 3 Out

NATURAL LOG OF CONTENT OF COMMUNICATION
(ALL CASES)

```
Histogram - Standardized Residual

NExp N       (* = 1 Cases,     . : = Normal Curve)
0   .18    Out
0   .35   3.00
0   .89   2.67 .
0  2.04   2.33  .
6  4.18   2.00 ***:**
7  7.66   1.67 *******.
*  12.6   1.33 ************:**
*  18.5   1.00 ******************:******
*  24.3    .67 ********************   .
*  28.7    .33 ******************************:***
*  30.3    .00 ******************************:***
*  28.7   -.33 ********************        .
*  24.3   -.67 ******************      .
*  18.5  -1.00 ******************:*********
*  12.6  -1.33 ***********  .
*  7.66  -1.67 *******:***
3  4.18  -2.00 ***.
2  2.04  -2.33 *:
1   .89  -2.67 :
0   .35  -3.00
0   .18    Out
```

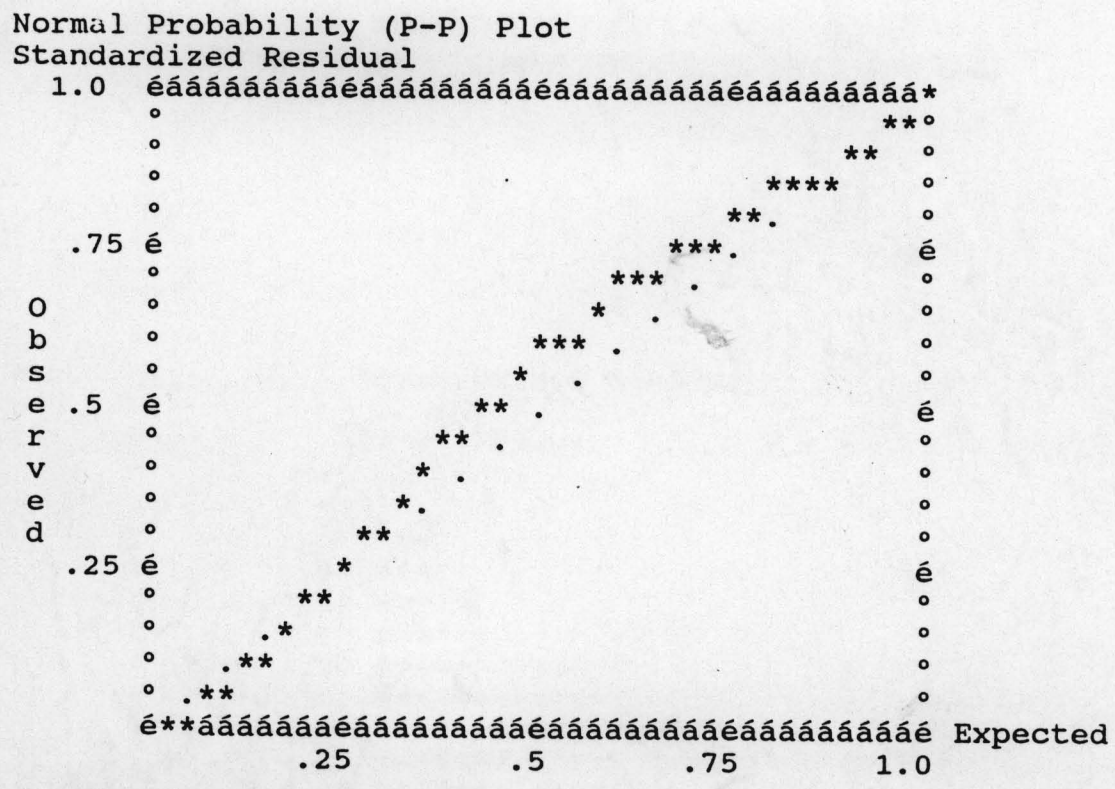

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
Expected
.25
.5
.75
1.0

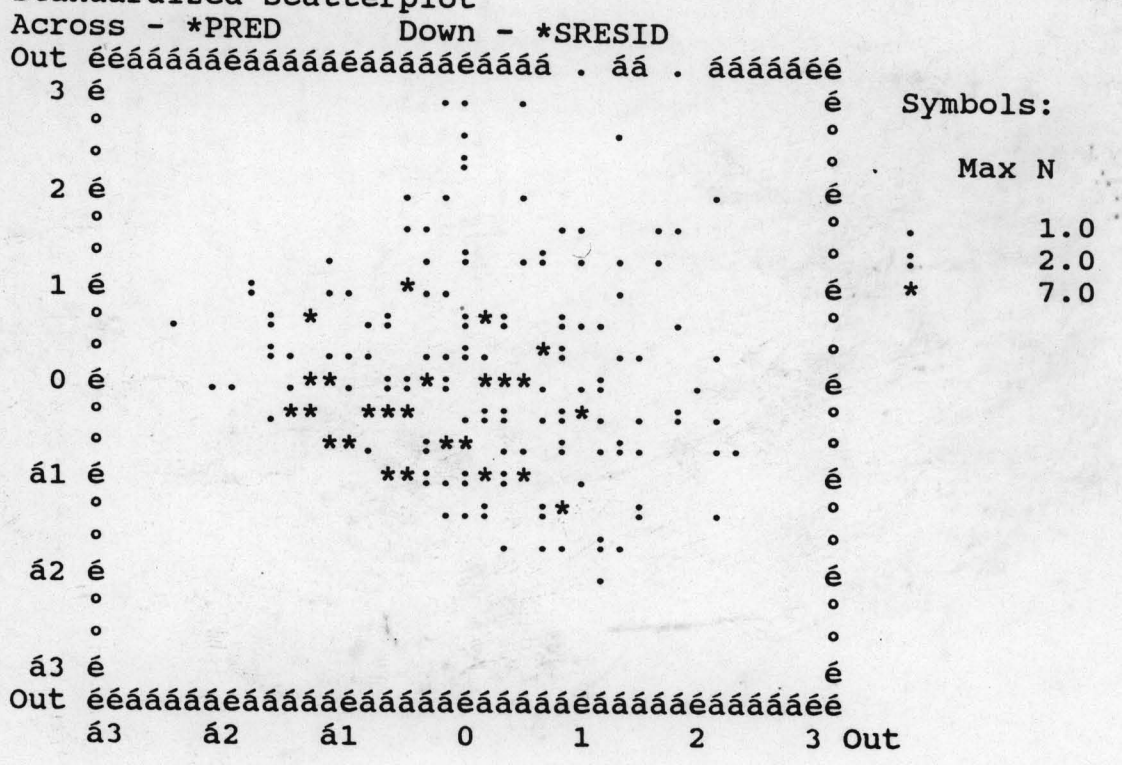

Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3 á2 á1 0 1 2 3 Out
Symbols:
Max N
. 2.0
: 4.0
* 8.0

CONTENT OF COMMUNICATION (UNTRANSFORMED)
(CASES FOR WHICH COMMUNICATION OCCURRED)

Histogram - Standardized Residual

```
NExp N       (* = 1 Cases,     . : = Normal Curve)
2  .18    Out **
3  .35   3.00 ***
1  .89   2.67 :
3 2.04   2.33 *:*
4 4.18   2.00 ***:
5 7.66   1.67 *****  .
* 12.6   1.33 ********** .
* 18.5   1.00 **********        .
* 24.3    .67 ********************  .
* 28.7    .33 ********************         .
* 30.3    .00 ******************************:*******
* 28.7   -.33 ******************************:*********
* 24.3   -.67 ************************:********
* 18.5  -1.00 ******************:*****
* 12.6  -1.33 ************:
5 7.66  -1.67 *****  .
1 4.18  -2.00 *  .
0 2.04  -2.33  .
0  .89  -2.67 .
0  .35  -3.00
0  .18    Out
```

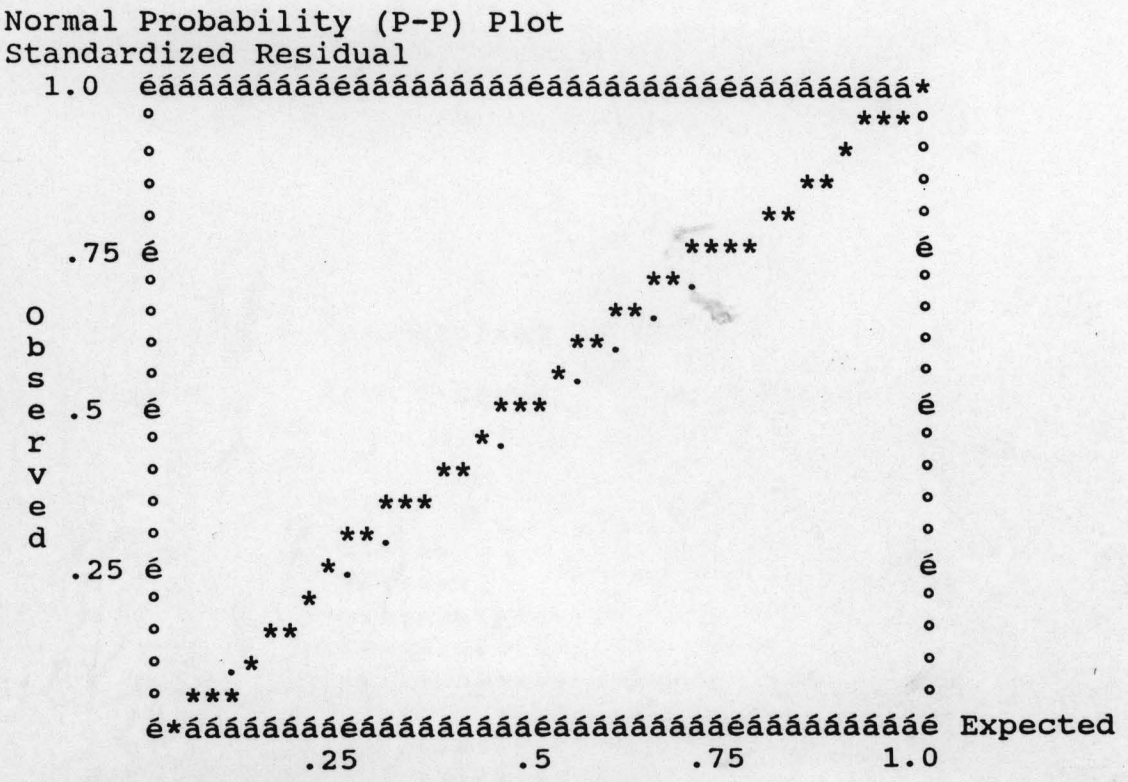

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected

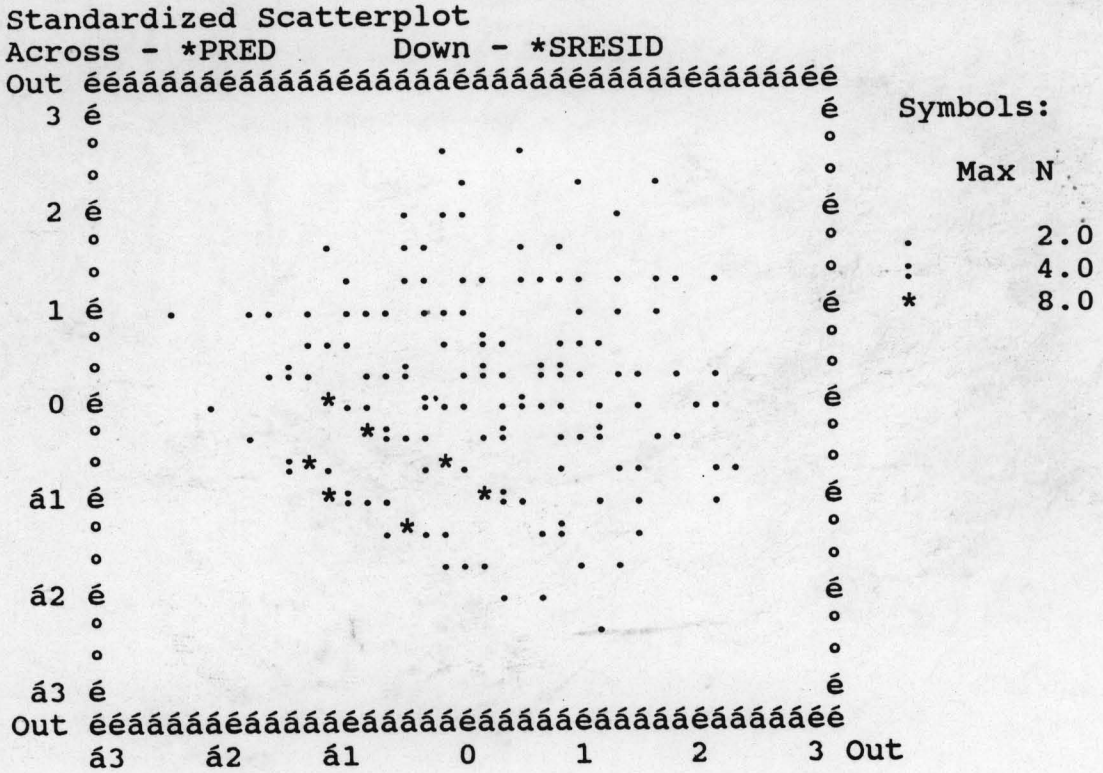

Standardized Scatterplot
Across - *PRED
Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
Symbols:
Max N
1.0
2.0
7.0
á3
á2
á1
0
1
2
3
Out

SQUARE ROOT OF CONTENT OF COMMUNICATION
(CASES FOR WHICH COMMUNICATION OCCURRED)

```
Histogram - Standardized Residual

NExp N       (* = 1 Cases,     . : = Normal Curve)
0  .18   Out
0  .35  3.00
2  .89  2.67 :*
4 2.04  2.33 *:**
5 4.18  2.00 ***:*
6 7.66  1.67 ****** .
* 12.6  1.33 ************:
* 18.5  1.00 ******************.
* 24.3   .67 ****************       .
* 28.7   .33 ******************************:**
* 30.3   .00 ****************************** .
* 28.7  -.33 ******************************:
* 24.3  -.67 ************************:****
* 18.5 -1.00 ******************:******
* 12.6 -1.33 ************:***
6 7.66 -1.67 ****** .
3 4.18 -2.00 ***.
1 2.04 -2.33 *.
0  .89 -2.67 .
0  .35 -3.00
0  .18   Out
```

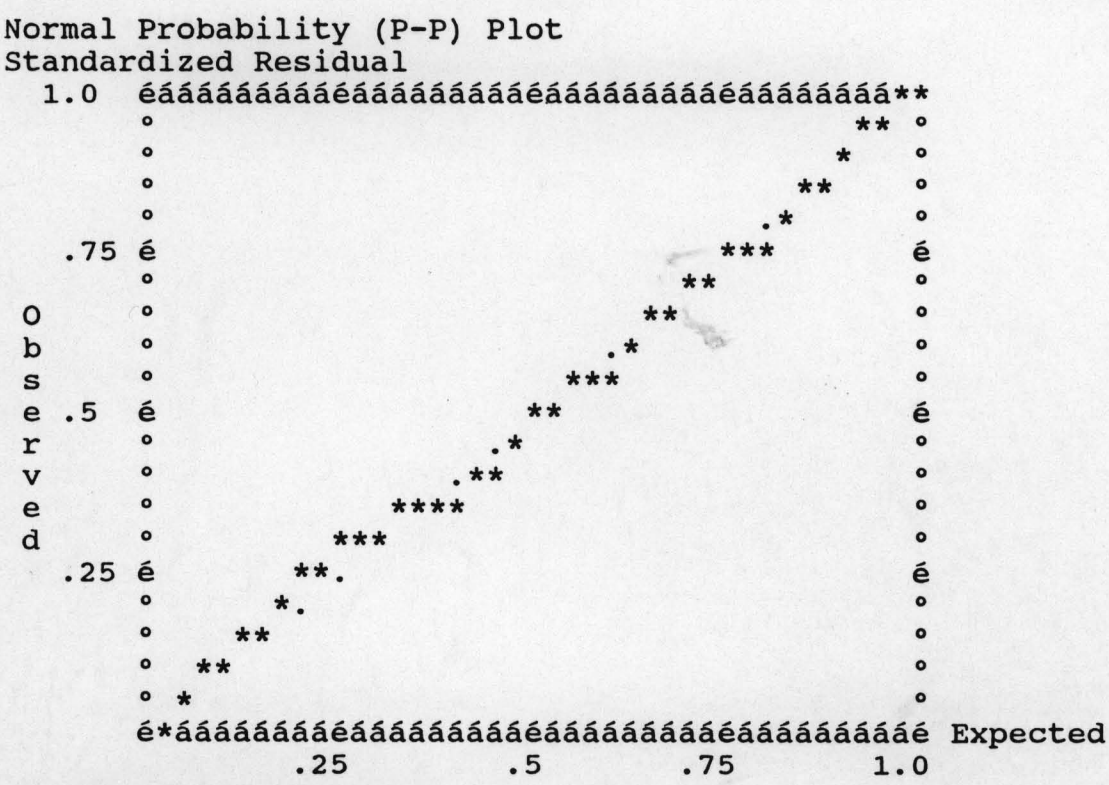

Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
Expected
.25
.5
.75
1.0

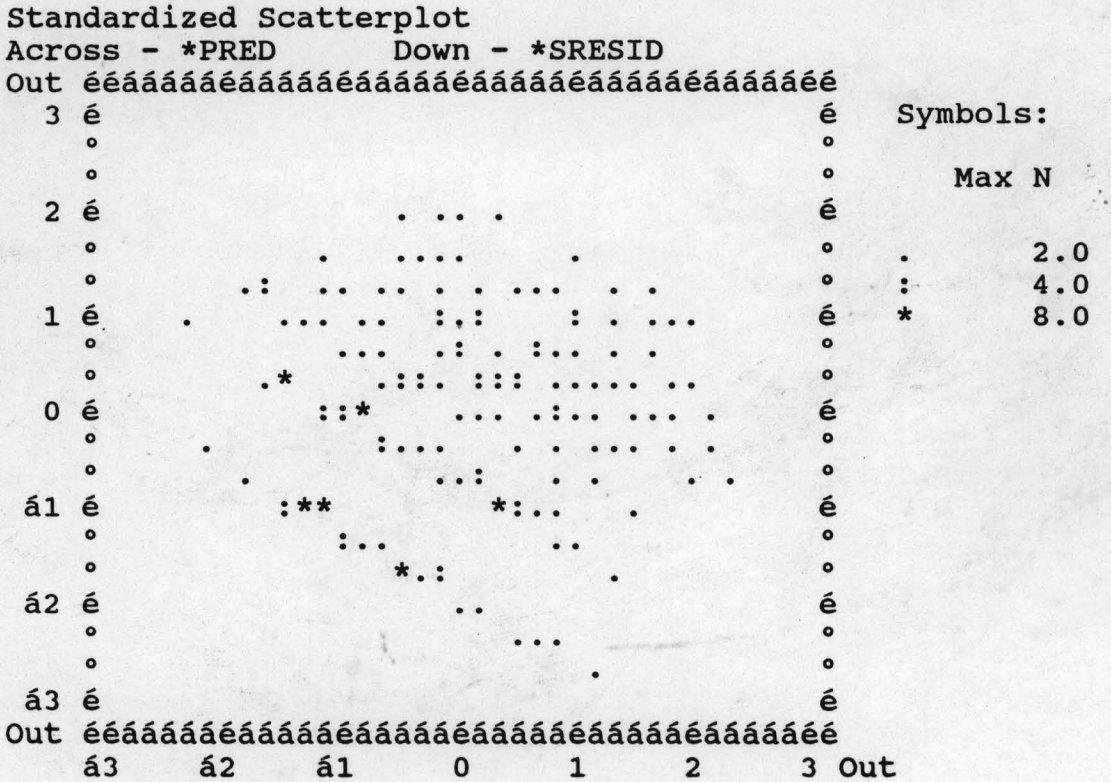

Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3 á2 á1 0 1 2 3 Out
Symbols:
Max N
. 2.0
: 4.0
* 8.0

NATURAL LOG OF CONTENT OF COMMUNICATION
(CASES FOR WHICH COMMUNICATION OCCURRED)

```
Histogram - Standardized Residual

NExp N       (* = 1 Cases,     . : = Normal Curve)
0  .18   Out
0  .35  3.00
0  .89  2.67 .
0 2.04  2.33  .
6 4.18  2.00 ***:**
7 7.66  1.67 *******.
* 12.6  1.33 ************:**
* 18.5  1.00 ******************:******
* 24.3   .67 ********************   .
* 28.7   .33 ******************************:***
* 30.3   .00 ******************************:***
* 28.7  -.33 ********************        .
* 24.3  -.67 ******************      .
* 18.5 -1.00 ******************:*********
* 12.6 -1.33 ********** .
* 7.66 -1.67 *******:***
3 4.18 -2.00 ***.
2 2.04 -2.33 *:
1  .89 -2.67 :
0  .35 -3.00
0  .18   Out
```


Normal Probability (P-P) Plot
Standardized Residual
1.0
.75
.5
.25
Observed
.25
.5
.75
1.0
Expected


Standardized Scatterplot
Across - *PRED Down - *SRESID
Out
3
2
1
0
á1
á2
á3
Out
á3 á2 á1 0 1 2 3 Out
Symbols:
Max N
2.0
4.0
8.0

APPENDIX R

SELECTED RESPONDENT COMMENTS

SELECTED RESPONDENT COMMENTS

PATIENTS:

1. The pharmacist at ------- is one of the most helpful, personal pharmacists our family has come in contact with. A personal element to a business such as this is greatly appreciated.

2. I am extremely pleased with the information and service I receive from my pharmacist. I truly trust his advice.

3. ------- is a very good pharmacist. He always takes time for me. Sometimes my doctor doesn't take the time to talk with me.

4. The medication was for my son. There's two other pharmacies in -------, but I would rather come to ------- - a friendlier atmosphere. I know my questions will be answered - even if I forget to ask something.

5. I come here because they always talk with me about my medicines.

6. ------- let me run up my bill to $800 to $1000 while my wife was sick. I appreciate his trust and trust the pharmacists at -------.

7. I'm an RN and know pretty much about my medications, but the pharmacist is real good.

8. I am extremely satisfied with my pharmacists.

9. I transferred to this pharmacy because a pharmacy near my home didn't give me a package insert for Proventil inhaler when I requested it.

10. I am going through cancer treatment. I value my pharmacist greatly. He is more accessible than my physician.

11. I don't need to talk with a pharmacist because I know everything all ready. For a new prescription, these pharmacists tell me everything I need to know.

12. I think sometimes pharmacists are more knowledgeable than doctors where medications are concerned.

13. My son-in-law is a pharmacist. I usually go to him.

14. My granddaughter used to work for -------. They told her not to spend so much time

with patients counseling them. I like it when ------- is here. He knows me. If I come in on Saturday and he's not here, the pharmacist doesn't know me so well.

15. I go to a chain pharmacy after hours only. Otherwise I get my medicines here - great service and personal.

16. ------- tells me more than my doctor does. He takes the time if I need it.

17. I take this prescription only when I have a dental appointment because I've had a heart murmur so need to take an antibiotic prior and after dental work.

18. My doctor is too rushed to tell me about my medications.

19. This is the first pharmacy we've gone to that give us so much information. I like it. ------ and ------- tell me information over and over at each visit. I like the reiteration of the information.

20. ------- just called my wife at home. I just came to pick it up.

21. I'm from ------- (a town over 25 miles away). I like the service here. That's why I drive all the way down here.

22. I don't need information on a refill. I just order it and pick it up. If I need any information the pharmacist tells me.

23. I spend over $300 per month on drugs and go to ------- pharmacy for other drugs that are cheaper. I usually don't go to this pharmacy, but they advertised a lower price for Procardia. Come to find out I'm using Procardia XL which is very expensive. I'm very dissatisfied.

24. I get the information I need. Today I didn't need any.

25. It has been very busy here at times. Today its slow. Privacy is better than usual.

26. I've been going here for about three times. All I get is a refill of Capoten. I never talk with the pharmacist.

27. Is the girl I talked with a pharmacist? (Note: she was not.)

28. I'm a regular here. I don't need information on refills.

29. I used to work here. Consultation was real quick today, but I've used this medication before.

30. I always ask questions when I come here.

31. I just was getting a refill. Didn't need to talk with the pharmacist.

32. I didn't need to talk with the pharmacist today. Other times, he is very good.

33. ------- is top of the line. I talk with the pharmacist more than my doctor. I like the sheets of information they put in my bag each time.

34. I'm from out of state; first time I've been here. The pharmacist told me about cough from Vasotec. My doctor didn't tell me that.

35. I like the information they put in the bag. Sometimes the pharmacist tells me more than my doctor does.

36. My doctor doesn't tell me about my medications.

37. I asked my doctor about interactions between an antibiotic and Tegretol. He said, "Ask your pharmacist."

38. I need information from my pharmacist only if I ask. They are real good.

31. I never talk with a pharmacist about my medications because they are refills.

32. My neighbor is a pharmacist. I ask him any questions I have.

33. I came from California - first time I've been to this pharmacy. I didn't know about these drugs - now I know I shouldn't drive when I take them.

34. I call in a refill ahead of time. If I have a question, I ask the pharmacist over the phone. They always tell me what I need. They can look it up on the computer.

35. I get information from my doctor. For new prescriptions, I talk with the pharmacist. She called me over once and talked with me. Otherwise, I don't talk with the pharmacist.

36. ------- pharmacy is OK. Cooperative, pleasant, and patient.

37. About a year ago I had a prescription filled here with six refills. The doctor said two years but they wrote in one year and now I must go back to the doctor for another two

year prescription.

38. ------ pharmacy also dispensed Ortho Novum 7-7-7 pills to me for birth control and did not mention that the penicillin may decrease the effects of the birth control pills. That information was given to me by the MD prescribing the penicillin.

39. I waited a long time. I took my daughter home because she was in pain from getting her wisdom teeth out. Then I came back for the prescriptions.

40. Pharmacists should put more information on the label so it doesn't get separated from the drug: what its for, how long to take it. I have so many drugs, if I'm not sure anymore I just throw them out.

41. I spent over $800 at this pharmacy last year. I know the pharmacists well. They call me aside if I need consulting.

42. I need more side effect information. I took a blood pressure medication that made me cough so much I coughed up blood. My doctor said to use candy to soothe my throat. I called the doctor again when coughing up blood. Then he said to stop the medication. Now I'm on Tenex for blood pressure.

43. This is the first new prescription I've received here since moving here from Michigan about a year ago. Never talked with pharmacist before, but today I needed to talk with the pharmacist. I was expecting a tablet but got a powder. I needed to know how to dose it with my other medications.

44. I call the pharmacist on the phone with questions.

45. I was asked by the pharmacist last time if I wanted to change to generic. I said, "No," then asked my doctor. He said, "Sure, go ahead and get the generic."

46. I call pharmacists here a lot if I need more information. Today, just a refill so I didn't need to talk with the pharmacist.

47. This is my first time to this pharmacy. Usually I go to a closer one to home. The pharmacist told me about drowsiness, my doctor did not. I'm glad the pharmacist did.

PHARMACISTS:

1. You have given me the opportunity to place greater value on my consultations (especially refills). I always try to do the best for each patient and this may be different

for each patient. Now I place even more time into constructing my consultations. I guess you have given me the incentive to renew my skills and try to do an even better job than before. Thanks.

2. Knowing the patient and his or her relationship with the physician (i.e. number of regular office visits) play a role in how important it is to counsel a patient. In a clinic pharmacy such as mine, I can keep a better handle on patient visits to doctors as well as more direct verbal contact with physicians.

3. While talking to patients about adverse drug reactions, I think that it is important to gear the information to the specific patient. Some patients would be afraid to take a medication if they were told of a "scary" ADR. Since retention of spoken information is limited, I feel its best to stress the most pertinent information such as what the drug is being used for, drug/food interactions, directions, side effects, what to do about missed doses. And always, if the patient has questions, they should feel free to call me!

4. Jon was a very nice, polite researcher - Glad to be of help to him. Am interested in reading the feedback when it is sent to us.

5. Thanks for your interest in our pharmacy. We try to maintain a friendly atmosphere. We enjoy greeting customers and counseling.

6. Consulting/giving drug information is the primary function of the pharmacist. If we don't do this our profession is doomed!