FACTORS AFFECTING OUTCOMES OF MEDICATION-HISTORY INTERVIEWING BY PHARMACY STUDENTS

by

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ABSTRACT

FACTORS AFFECTING OUTCOMES OF MEDICATION-HISTORY INTERVIEWING BY PHARMACY STUDENTS

Paul Lucien Ranelli

Under the supervision of Professor Bonnie L. Svarstad

Factors affecting outcomes of medication-history interviewing by pharmacy students were studied.

Data were obtained from 112 fourth-year pharmacy students enrolled in a required course in Fall 1984. Each student conducted a medication-history interview with one of two simulated patients (one man, one woman) who presented a predetermined history. Interviews were videotaped behind a one-way mirror. Students also completed an attitude survey and personal report of communication apprehension (PRCA). A panel of trained raters evaluated the videotaped interviews using measures of interview skill and completeness. The simulator completed a patient satisfaction form after each interview. Two path models were developed that were identical except one had completeness and one had patient satisfaction as the dependent variable. Interview skill was the final factor in each model, preceded by variables representing the student's background characteristics, attitudes and values, and PRCA. Simulated patient gender was also included.

All 112 students conducted the interview, and 96% and 85% completed the PRCA and attitude surveys, respectively. Cronbach's alpha coefficients for the skill and completeness measures were 0.92 and

0.94, respectively. The models explained 36% and 27% of the variance in patient satisfaction and completeness, respectively. Shown in parentheses are the significant ($p \leq 0.05$) direct predictors of variables in the model of patient satisfaction: satisfaction (skill, prepharmacy gradepoint average [preGPA], people and health-care [P&HC] orientation); skill (interviewing orientation, preGPA); interviewing orientation (P&HC orientation, preGPA, PRCA); P&HC orientation (student gender--being female). All effects were positive except for PRCA on interviewing orientation. For the model of completeness, direct predictors were as follows: completeness (skill, P&HC orientation, student gender, simulated patient gender); skill (interviewing orientation, preGPA); interviewing orientation (PRCA, preGPA, P&HC orientation); P&HC orientation (student gender). All effects were positive except for PRCA on interviewing orientation and for P&HC orientation on completeness.

These results suggest that the models represent behavioral outcomes of medication-history interviewing at two levels: patient assessment of competence in terms of satisfaction and clinician assessment of competence in terms of completeness. The behavioral outcome of process directly influences both.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

A. Introduction

The specific purposes for which interviews are conducted are many and diverse. For instance, the purpose may be therapeutic change as in the psychiatric interview, instruction and appraisal as in interviews initiated by a supervisor with a subordinate, selection and assessment as in interviews conducted with job applicants, and acquisition and investigation as in interviews conducted as part of a research project.

A medication-history interview, which is an interaction of a patient with a health professional (usually a pharmacist, nurse, or physician), has a multifaceted purpose. The health professional initiates the interaction to investigate and acquire data about the patient's medication-taking experiences, to assess the patient's understanding of past and current medication-taking experiences, to assess the patient's motivations for complying with the medication regimen, and possibly to evaluate a change in the regimen if the information gathered warrants such an action.

The purpose of my research is to study factors affecting the outcomes of medication-history interviews by pharmacy students. The study aims to determine whether pharmacy students' performance on a medication-history interview, measured using instruments developed to score levels of interviewing content and patient satisfaction can be explained by structural equation models that include background,

value, and attitudinal characteristics of the interviewer; gender of the interviewer and patient; communication apprehension of the interviewer; and the interviewing process of the interviewer.

In all interviews, regardless of type, the accuracy and completeness of the data gathered is important. The central value of the interview as a research tool is that it allows the participants to assess the subtleties of their mutual understanding. Interview situations offer an implicit (or explicit) opportunity for feedback through sharing, negotiation, clarification, and verification, thereby facilitating the collection of high quality data. For example, a patient completing a written medication-history questionnaire may check "yes" for penicillin allergy, and that information would be reported on the patient's medical record as such. In a medication-history interview, however, the interviewer can explore the nature of the experience the patient defines as a drug allergy and, in this way, better assess whether the experience most likely reflects an allergic reaction or simply an unpleasant side effect. Without such clarification, a prescriber may unnecessarily avoid using the antibiotic of choice when indicated.

It is important to study factors affecting outcomes of medication-history interviews because the histories serve as a crucial source of information for the pharmacist. It has been shown that pharmacists have contributed to patient care by obtaining information about past and present medications, history of allergies and side effects, and attitudes toward drugs, as well as by determining compliance behavior and therapeutic response to drugs (see, for example,

Stewart and Cluff, 1974; Caranasos, Stewart, and Cluff, 1974). Some evidence also indicates that pharmacists elicit more information regarding use of prescription and nonprescription products than is usually documented by physicians and nurses in a medical history in a patient's chart (see, for example, Dobbs, 1981; Covington and Pfeiffer, 1972).

It is not enough for pharmacists to collect the information, though; the information must be used. The direct patient-pharmacist interaction during a medication-history interview frequently provides the pharmacist with an opportunity for beginning a professional relationship with the patient and for collecting therapeutic data on which other clinical activities depend. Several studies documented that information gathered by pharmacists in medication-history interviews can be incorporated in subsequent counseling sessions to produce a beneficial impact on patient-care outcomes (see, for example, Bond and Salinger, 1979; Morse et al., 1986).

Pharmacy practitioners have been concerned with the information outcome of the interview, but there also are other outcomes that should be considered, such as satisfaction of the participants with the interaction and evaluations of the interviewing process. Too, very little attention has been directed to studying the interviewing interaction per se as a complex social process in an effort to determine how characteristics of the interviewer, respondent, type of information collected, and the environment influence interviewing outcomes. My study was designed to help fill these voids.

Just as researchers need to develop multifaceted analytic

approaches for studying physician-patient interactions, researchers must look beyond one-dimensional analyses of pharmacist-patient interactions. Mason (1979, p. 309) argues that only an objective, systematic approach can take into account all dimensions of pharmacist-patient interaction and explore the determinants of pharmacists' counseling behavior. The same can be said for pharmacists' interviewing behavior. It is not known what factors best predict pharmacists' or pharmacy students' interviewing behavior within the context of a medication-history interview. Only by identifying and studying the interviewing interaction as a whole will the pharmacy profession acquire information for reassessing pharmacists' interviewing role.

In the following sections of this chapter, I review the literature relating to the three interviewing outcomes of process, content, and patient satisfaction. Next I review factors hypothesized to influence the interviewing outcomes. Then, after describing the rationale for using patient simulators for researching and teaching interviewing to health professionals, I outline the temporal model of medication-history interviewing outcomes evaluated in this study.

B. The Conceptualization and Measurement of Interviewing Behavior

1. Overview

My review of the literature revealed at least three approaches to the evaluation of interviewing. Some researchers have examined whether professionals use certain techniques or skills as a representation of interviewing "process." Others examine the accuracy, amount, or quality of the information obtained as a representa-

tion of "content." Still others examine whether the recipient of an encounter had their expectations met as a representation of "patient satisfaction." In Part B of this chapter, I review the literature relating to these three interviewing outcomes of process, content, and patient satisfaction.

Interviewing process refers to the techniques that are used to gather clinically valid and reliable information. In other words, interviewing process is a set of distinct yet interdependent tasks and abilities interviewers must perform and possess. I label this set of tasks and abilities "interview skill."

Interviewing content refers to the amount or quality of the information gathered from an interview. In my study, I shall focus on the amount of information that is gathered by pharmacy student interviewers. I label this variable "interview completeness."

Patient satisfaction is whether the patient's expectations are met. Expectations may vary from a general evaluation of health care, personnel, or facility to a particular evaluation of a provider, interview, or encounter. In my study, I focus on patient satisfaction with the specific medication-history interviewer and interview.

Many studies focus on interviewing process only as an outcome variable, but process also can affect other interviewing outcomes. For instance, if a question is improperly worded, inserted out of context, or leads the respondent to respond in a certain way, the resulting information may be biased (Cannell, Marquis, and Laurent, 1977). Underreporting or inaccurate reporting by a respondent, such as that demonstrated in the comparison of medical and patient records

by Cannell, Oksenberg, and Converse (1977), may result from a respondent's dissatisfaction with the interview or from lapses in the respondent's knowledge, memory, or willingness to report. Interviewer personalism can be a source of bias if the respondent is led to concentrate on the pleasures of the social relationship instead of the importance of accurate information (Weiss, 1968; Henson et al., 1977).

If asked to advocate one characteristic of an interviewer for obtaining good data, Fowler and Mangione (1986) recommend that "...he or she conveys to the respondent that the accuracy of the data is important" (p. 10). Their response is based on a study of interviewer effects on results of large health surveys, but many of their findings are applicable to one-on-one medication-history interviewing sessions and support the concept of process affecting other interviewing outcomes. Interviewers whom respondents rated as being most concerned about accuracy produced significantly less biased data. Specific ways interviewers can communicate the importance of accuracy are by controlling the pace at which the interview proceeds, being attentive to the responsibility to ask questions properly, probing carefully, and relating to respondent needs.

No studies have specifically looked at how interviewing processes or skills affect the amount of information obtained, patient satisfaction, or other outcomes of medication-history interviews. Svarstad (1986) reviews theoretical and empirical evidence for communication behaviors that may enhance a patient's understanding and motivation, especially when it comes to the outcome of medication compliance. Much of the supporting evidence comes from studies of physician-

patient encounters, mainly counseling, but I submit the evidence is applicable to information-gathering sessions as well and may be the basis for helping to understand the impact interviewing process has upon interviewing content and patient satisfaction. For instance, patients may be motivated to provide complete and accurate information and they may be satisfied with the encounter if the pharmacist explains the purpose of the interview, asks questions in a logical sequence, repeats answers when necessary to make sure the answer was not misunderstood, eliminates jargon from questions, provides appropriate feedback, and acts in a directive and yet approachable manner.

By including the concept of interviewing process as the final factor in the path models of medication-history interviewing, I hope to help explain the relationship between interviewing process and the outcomes of interviewing content and patient satisfaction.

2. Interviewing Process

The purpose of this section is to evaluate how others have conceptualized and measured interviewing process of pharmacy and medical students. The section includes my general description of interviewing process derived from the pharmacy and medical literature. Global measures of interviewing process are reviewed, as are efforts to improve the interviewing process of medical and pharmacy students.

Interviewing has no comprehensive theory to draw upon for causal relationships. Ideas about effective questioning, for example, are often drawn from folklore, experience, and common sense. A review of the available literature also reveals very diverse measures of inter-

viewing process, with some based on global analysis techniques and others based on the interactional analysis approach. This makes it difficult to draw any definitive conclusions about the effectiveness of various questioning techniques. For example, some researchers create a broad outcome measure that does not clearly distinguish between process and content (Barbee et al., 1967); others focus on just one component of interviewing skill, like empathy (Penwarden, Rowland, and Shaffer, 1982; Dolinsky and Lantos, 1986; Kalisch, 1971). Previous workers also have neglected the need to document the reliability and validity of their measures or to describe methods of training raters. In many cases, reports offer only a sample of items included in the process measure, not its complete working definition.

Global versus Interactional Approaches. Barsky and colleagues (1980) drew a distinction between two general ways interviewing is studied. In the global analysis method, general ratings are made based upon an overall impression of the interaction. In contrast, the interactional analysis approach quantifies discrete behaviors in an effort to find routine patterns that are the structuring activities assembling the social reality of the event (Fisher and Todd, 1983, p. 12); interaction process analysis (Bales, 1950) and verbal response mode taxonomy (Stiles et al., 1979a, 1979b, and 1984) are examples of the interactional approach. Both global and interactional approaches have been shown to be valid and reliable (Scott et al, 1973; Hess, 1969; Korsch, Gozzi, and Francis, 1968; Barbee et al., 1967).

Compared with global analysis, interactional analysis is inflexible. It is only attuned to verbal exchanges of the patient and

health professional. While the finite, categorical measures of process may be useful in identifying individual interviewers' weaknesses in educational programs, the categorical measures do not provide a good appreciation of the whole interaction; its structured format risks losing the interview's subtlety and variability. Also, interactional analysis can be unwieldly in some research and educational situations since the raters must be extensively trained and all interviews must be transcribed.

The strengths of the global method, on the other hand, lie in its relative simplicity and its ability to capture the richness and complexity of the interview. Having a continuous global or summary measure also is useful when researchers attempt to relate interviewing process with other determinants and outcome measures of interviewing behavior; multiple single-item or category scores would not be practical in multifactor models. For these reasons, I chose to focus on global or summary measures of process.

Global Measures of Interviewing Process. In my study, interviewing process within the context of a medication-history interview is the gathering of information in such a manner that the amount, completeness, quality, or accuracy of that gathered is enhanced. My review of the literature suggests that this process can involve a variety of tasks that require the following skills or abilities:

1. Ability to introduce self and exchange names;
2. Ability to discuss purpose, identify role, and elicit patient's reason for visit;
3. Ability to use nonverbal behaviors effectively;
4. Ability to use the appropriate question style at the proper time;
5. Ability to clarify and verify information elicited;

6. Ability to use proper interviewing structuring, including pace, articulation, logical sequencing, lack of jargon, transitions, avoidance of interruptions, and nonjudgmental manner; and
7. Ability to close the interview smoothly and effectively.

Interestingly enough, I could find only six studies that used global measures of these skills in the context of medical interviewing (Table 1). Of these, only the Arizona clinical interview rating (ACIR) scale was systematically developed and tested for reliability and validity. The ACIR scale, developed by Stillman in 1974 as a tool for teaching and evaluating the interviewing process of medical students (Stillman, Sabers, and Redfield, 1976), was later used as a model for the ACIR-pharmacy (ACIR-P) scale for measuring pharmacy students' interviewing process (Gardner and Burpeau-DiGregorio, 1985; Gardner and McGhan, 1986). The scales used in the other studies are based strictly on the authors' experiences and observations.

According to Stillman and colleagues (1977), the unique contribution of the ACIR scale is that it is primarily concerned with the process of interviewing. The development of the scale began with the observation of interviews conducted by physicians considered by the authors to be expert interviewers; based on these interviews, 16 skills considered to differentiate "good" and "bad" interviewing were identified. In 1980, Stillman et al. (1983) refined the scale to 14 items, still covering the same skill areas (Table 2). The item scores or subsection scores within each skill area were meant to be added to produce one total score. According to Stillman and associates, (1977, p. 1032), subscores for skill areas and individual items should not be reported "because of the expected unreliabilities of [sub]scores based

Table 1. Global Measures of Interviewing Process

Reference	No. Items	Rating Mechanism	Scale Description	Interviewers	Reliability or Validity Assessed	Comments
Barbee, Feldman, and Chosy (1967)	8	7-point scale, where 1 is ideal or completely adequate and 7 is complete omission or totally inadequate	Negatively-worded statements relating to errors in data collection, interview structure, communication, interviewer role, plus an overall summation rating	Sophomore medical students	Reliability	Significant interrater agreement (Pearson product moment) on the summary question, errors in data collection, and errors in interview structure; test-retest reliability very poor
Foley and Sharf (1981)	27	4 categories (not done, only partially or rarely done, completely or usually done, not applicable)	Scale contains positively-worded statements relating to putting patient at ease, question style, interviewer control, rapport, and closure	Medical students, practitioners	Neither	
Irwin and Bamber (1984)	19[a]	4-point scale, where 1 is poor and 4 is very good		Medical students	Neither	Used factor analysis to identify five factors (loadings $\geq$0.40), then divided factors into two groups labeled social learning skills and professional skills

Table 1 (continued)

Jarrett et al. (1972)	23[b]	5-point scale, where 1 is very poor and 5 is very good	Process items relate to interview structure (4 items), interviewer role (4 items), and communication in the interview (6 items)	Medical students	Reliability	Interrater reliability (Kendall's coefficient of concordance) shows scale merits "further investigation and application"
Maguire and Rutter (1976)	10	Dichotomous for discrete techniques, where 1 is present and 0 is absent; 5-point scale for complex techniques, where 0 is very poor and 4 is very good	Avoidance of personal issues, acceptance of jargon, imprecision, failure to pick up verbal leads, repetition, lack of clarification, lack of control facilitation, inappropriate question style, other difficulties	Medical students	Neither	Histories analyzed as number of accurate and relevant items of information they contained
Stillman et al. (1983)	14	5-point scale, with anchoring statements at 5, 3, and 1	See Table 2	Medical students	Both	Internal consistency (alpha coefficient) of 0.60–0.72; trained mothers served as simulated patients and evaluators

[a]The scale was developed by Verby et al. (1979).

[b]Of the 23 items, 14 pertain to process and 9 to content.

Table 2. Skills in the ACIR Scale[a]

Organization
Thoroughness
Use of transitional statements
Questioning style (open-ended questions, interview delays, repetition, use of summary statements, and use of jargon)
Data documentation and verification
Rapport (eye contact, interruptions, empathy, and positive reinforcement)
Appropriate closure allowing for patient feedback and questions

[a]Each item is descriptively defined on a five-point scale with anchoring statements at the 5, 3, and 1 levels.

on only a few items."

Stillman et al. (1977) took several paths toward testing the ACIR scale's construct validity. First, they compared scores from a group of preclerkship medical students with a group of postclerkship students and found that the postclerkship students did "a better job." Then, by comparing students' ACIR and medical college admission test scores, they concluded that the ACIR scale does not measure medical or scholastic aptitude. Finally, on the basis of three studies, they observed that changes in medical students' ACIR scores correspond with changes in interviewing techniques.

An advantage of the ACIR scale as a measure of interviewing process is that it can be used in conjunction with any check list or rating scale that measures the amount, completeness, or accuracy of information (content) obtained by interviewers. Users of the ACIR and ACIR-P scales for educational purposes cite the practical advantages of having the simulated patient rate the student (Stillman et al., 1976; Gardner and Burpeau-DiGregorio, 1985; Gardner and McGhan, 1986), but use of the simulator as rater for research purposes can cause problems. According to Stewart and Cash (1985, p. 40-41), the complexity of interviews and the mixture of verbal, nonverbal, and relational components make the identification of specific behaviors very difficult. Also, a tremendous amount of behavior is compressed into a short time period. It would be possible to overcome this limitation by having only raters (not simulators) complete the ACIR form, although researchers have not yet tried this approach.

One other study in Table 1 deserves mention because of its data

analysis method. Irwin and Bamber (1984) used factor analysis to distinguish between communication skills acquired through the normal processes of social learning as a member of various "social groupings" and through the more technical and formal aspects of communication appropriate in the "professional context." I believe that Irwin and Bamber's (1984) results illustrate one inherent criticism of factor analysis when used as a confirmatory statistical procedure: It is difficult to differentiate what skills belong to a label given to each list. Why, for example, should "picking up nonverbal cues" and "use of silence" fall in the professional group," while "keeping patient to relevant matters" and "use of facilitation" fall in the social-learning group? In addition, one item relating to the use of medical jargon did not load on any of the factors, even though I would expect to find that within the professional skills group.

Teaching. To gain an appreciation for how measures of interviewing process are used, the remainder of this section evaluates three studies aimed at improving the interviewing process of medical and pharmacy students (Table 3). Since some of these studies assessed content as well as process, those results are presented where appropriate.

Two studies at the University of Arizona College of Pharmacy used objective measures of both <u>content</u> and <u>process</u> for evaluating student performance on medication-history interviews (Gardner and Burpeau-DiGregorio, 1985; Gardner and McGhan, 1986). In this program, <u>patient simulators</u> who were nonpharmacists functioned in the multiple roles of patient, teacher, and evaluator.

Table 3. Selected Teaching Programs that Assessed Interviewing Process of Medical and Pharmacy Students

Reference	Process Rating Scale	Interviewers	Raters	Design	Results
Gardner and Burpeau-DiGregorio (1985)	ACIR-P	45 Undergraduate pharmacy students	2 Patient simulators	2 Groups of students, who interviewed both simulators in a cross-over design in consecutive four-week periods; patient had hypertension history	Scores significantly increased from first to second interviews (scores were 66% and 84%, respectively)
Gardner and McGhan (1986)	ACIR-P	62 Undergraduate pharmacy students	2 Patient simulators	2 Groups of students, where group 1 pretested with simple history and group 2 pretested with complex history-1; all posttested with complex history-2	Group 1 scored 70% and 87% on the pretest and posttest, respectively; group 2 scored 64% and 92%; scores between groups on both tests were significantly different
Carroll, Schwartz, and Ludwig (1981)	Adaptation of ACIR and affective rating scale[a]	22 Medical students	3 Patient simulators	Students did 3 interviews with 3 simulated patients	Significant gains in simulators' and self ratings across three interviews; no change in faculty ratings

[a]Adapted from the ACIR scale (Stillman et al., 1977) and the affective rating scale (Tinning and Schneider, 1976, p. 81, as cited by Carroll et al., 1981). The intraclass correlation coefficient (Ebel, 1951) for two videotaped interviews was 0.60 for individual simulator ratings and 0.85 for the average ratings of multiple simulators. The two faculty raters produced an interrater coefficient of 0.64, as measured by the Pearson product-moment correlation.

In the first of the two studies at the University of Arizona, two patient simulators were rehearsed and trained to present a history of hypertension (Gardner and Burpeau-DiGregorio, 1985). After classroom instruction in interviewing, each pharmacy student completed one interview with one simulator and another interview with the other simulator in one-hour sessions (using a crossover design). The students gained approximately 20% in both process and content scores between the first and second interviews ($p < 0.001$).

The second study (Gardner and McGhan, 1986) compared the effect of varying the complexity of the medication history for the first interview on improvement in a subsequent interview. Students in group 2 who were pretested with complex history-1 had significantly lower ACIR-P scores on the pretest and significantly higher scores on the posttest than students in group 1. Looking at the entire sample, gains greater than 20% were seen in six areas reflecting rapport and interview technique; these were use of summary statements, empathy, thoroughness, organization, data documentation, and positive reinforcement of the patient. Gains of 10-20% were noted in four areas, three that dealt with interview technique (use of transitional phrases, opportunity for questions, and appropriate use of open-ended questions) and use of jargon. It should be noted, however, that in breaking down the total process score these researchers violate Stillman's tenant of not using subscores for the ACIR scale.

While the Gardner and McGhan (1986) study is the only one that specifically examines the interviewing behavior of pharmacy students, it does not offer much of an explanation for that behavior. The

authors do not control for the students' background characteristics or attitudes. Also, while the design allows for the possibility of maturation effects occurring, those are not assessed; the authors suggest, however, that it is unlikely that other experiences, like internship, accounted for the improved scores since the time between the interview sessions was short. The problems of using the patient as rater have been previously discussed.

Carroll, Schwartz, and Ludwig (1981) evaluated the use of simulated patients for teaching interview skills to medical students, but their tested objectives tell a larger story than just an evaluation of a teaching method. Students completed three interviews with three simulated patients. After each interview, the student and the simulator independently completed a content check list (not described in the article) and a process rating form. They discussed any discrepant ratings and then reviewed the interview on videotape. Faculty rated each student's first and third videotaped interviews.

The results of the analysis of variance for the mean process ratings across the three interviews are shown in Table 3.[1] Through factor analysis of the simulators' process scores, four factors were identified: inquiry skills, listening skills, facilitation skills, and closure. Using these as the factors, subscores of the relevant items were summed (unweighted) for all three rater groups. Examination of the subscores as measured by the three rater groups showed no

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[1]Since the format and content of the check list was not described, I have no way of evaluating that portion of the study. The results simply stated that, for all three sets of raters, there were no significant changes in the overall content scores.

significant gains for inquiry skills and closure skills and significant gains for facilitation skills. Only the scores by the student raters showed significant improvement for listening skills.

Based on these results Carroll et al. (1981, p. 524) conclude, "...[R]elying on a single, overall mean score of all the interview skills measured can mask important differences among distinct sets of skills." They assert that the factor analysis helped "...identify a deeper consensus between faculty and simulator ratings" than is evident in the analysis using total scores. Unfortunately, the authors do not provide adequate detail to determine whether that conclusion is justified. The article does not list the items in the factors, and so face validity cannot be assessed. Also, using just the simulators' scores for the factor analysis may distort the results. Finally, while I agree that subscores may be beneficial when the measure is intended for educational purposes, that does not necessarily transfer to other intended uses of interviewing process measures, such as for evaluating the effect of process on other interviewing outcomes.

The discrepant trends among the three rater groups in the Carroll et al. (1981) study may suggest that the faculty raters had different perceptions of desired interview skills than the students and simulators. Based on a study that showed medical students' cognitive understanding of medical interviewing principles (via paper and pencil test) is significantly negatively correlated with interview performance during clerkship the next year, Ware et al. (1971) suggested that cognitive understanding "gets in the way" of performance. An alternative explanation, however, is that the clerkship instructors

who rated the student interviews had different goals, expectations, and skills than those taught to the students; therefore, the negative correlation of cognition and performance reflects this discrepancy. In measuring the effects of educational interventions, it seems important that the raters have the same interviewing orientation and training as the students they evaluate.

Summary. Both the descriptive and empirical literature provide information on what constitutes interviewing process, and this information can be incorporated into global measures of interviewing process. Advantages of the ACIR scale that should be incorporated into any measure of interviewing process are an exclusive focus on process and flexibility for use with any content check list. To avoid bias, evaluation forms should be completed by someone other than the simulated patient. It is important that raters have the same interviewing orientation and training as the students they evaluate.

3. Interviewing Content

Most of the research relating to the content gathered by pharmacists in medication-history interviews stems from comparisons of pharmacists with physicians and nurses. Other studies compare the effect of educational interventions on the information obtained in patient interviews by pharmacy and medical students. All of these studies, which are reviewed in this section, provide insight into how others conceptualized and measured interviewing content.

Approaches for Measuring Interviewing Content. I see two general approaches for evaluating information obtained in a medication-history

interview. One approach compares the interview results with an independent measure of content. For instance, the results can be compared with the patient's actual medical record, which is presumed to contain complete and accurate information. Or, if the patient is a simulator, the collected information can be compared with the scripted history. This is often done by developing in advance a check list containing specific points from that history, and the information collected is reported as a percentage of the total number of points on the list. Researchers can place predetermined values on the gathering of specific pieces or types of information and, in this way, they can attempt to define clinical importance.

While this approach is useful because the accuracy of the information collected can be assessed, the preparation of individual check lists and comparisons with the medical record is time consuming.

The other approach for evaluating the informational outcome of a medication-history interview looks strictly at the amount of information gathered. Each unit or piece of information gathered is weighted equally, and all information is assumed to be correct. Using this approach, content is generally reported as the number of information points collected or as a list of categories of information addressed in the interview (i.e., asked patient for names of medication, side effects, allergies, etc.). The primary advantages of this completeness approach are its flexibility and ease of use; it is not necessary to develop a check list for each new medication history. Also, since measures developed using this approach can be used for evaluating actual and simulated patients, pharmacy clerkship preceptors can use

the measures for evaluating the interviews of pharmacy students with actual patients. In addition, by weighing all information points equally, the approach recognizes that it is impossible to predict in advance what specific piece of information will be the key for identifying or solving a specific patient's medication problem. A disadvantage of this approach is its inability to judge the accuracy of the information collected.

Measures of Interviewing Content. In my study, interviewing content within the context of a medication-history interview is the amount or completeness of information collected by the interviewer. Reviews of the professional literature by Okubo (1986) and me suggest that the content of a medication-history interview can involve asking patients a variety of questions, including the following:

1. What medication(s) is being taken?
   a. What is the medication being used for?
   b. Why is the medication being taken?
2. Is the medication being taken?
3. How is the medication taken?
4. How often is the medication taken?
5. When and with what is the medication taken?
6. How regularly is the medication taken?
7. For how long is the medication to be taken?
8. Is the medication working?
9. Are there any bothersome effects from the medication?
10. Does it ever happen that you forget to take the medication?
11. What happens if you don't take the medication?

Although there is no consensus about the specific questions that should be asked in a medication-history interview, most authorities expect the interviewer to obtain this type of information about prescription and nonprescription medications the patient currently takes. The interviewer also is expected to gather information about medications taken previously, allergies, and problems with adverse

effects.

The studies that compare the results of pharmacist interviews with physician or nurse interviews illustrate the different ways of defining and measuring interviewing content. As shown in Table 4, pharmacists' histories compare favorably with the informational outcome of other health professionals' histories, although I believe the research methods used to arrive at the conclusions vary in robustness. Only one pharmacist served as the basis for comparison in three studies (Badowski et al, 1984; Covington and Pfeiffer, 1972; Wilson and Kabat, 1971), and in all but one study (Dobbs, 1981) the pharmacists were aware the study was being conducted.

All of the studies in Table 4 are hospital based and use inpatients as subjects. The studies only look at the amount or kind of data collected. It should be kept in mind that these studies base the comparisons on written records of the interviews, and it is not known whether the written records accurately reflect the oral transactions. For instance, errors in transcribing could have occurred. Also, pharmacists, physicians, and nurses could have collected identical information but different perceptions of importance affected what they recorded. In addition, the studies never address the order of the interviews, even though the order could possibly influence content by altering the patient's willingness and ability to recall and report information; this latter point illustrates the need to study the effect of interviewing process on other interviewing outcomes.

It is interesting to note that one study suggested it was the pharmacists' data-collection form that contributed to the pharmacists'

Table 4. Measures of Interviewing Content Used in Studies Comparing Pharmacists with Other Health Professionals

Reference	Method of Collecting Information	Categories of Content	Results
Badowski et al. (1984)	Three-member clinical panel compared written pharmacist histories for 80 patients with physician histories in the chart, which served as controls; assessed the clinical importance of additional information collected	92-item open-ended questionnaire	11% of the pharmacist's drug histories reported clinically important information missed by the physician
Barger and Barger (1976)	Comparison of pharmacist histories for 50 patients with admission histories by nurses and physicians in the charts; follow-up review of 100 patient charts after nurses began using data-collection form similar to that of pharmacists	Prescription drugs, nonprescription drugs, and allergies	Pharmacist histories had twice as many prescription drugs and 10 times as many nonprescription drugs; on follow-up study, nurses identified 50% more prescription drugs for all patients and 300% more nonprescription drugs per patient than they did in first study
Covington and Pfeiffer (1972)	Comparison of pharmacist histories for 58 patients with physician-acquired information in the charts	Allergies, drug sensitivities, prescription medications consumed immediately before admission, missed doses, nonprescription medications consumed regularly during the past year, and use of someone else's medication	For all categories pharmacists collected more information; physicians identified 20% and 1% as many prescription and nonprescription drugs as the pharmacist

Table 4 (continued)

Dobbs (1981)	Retrospective review of physician admission histories and routinely conducted pharmacist histories for 50 patients	Prescription drugs (how taken, missed doses, when stopped), medications borrowed from other patients, nonprescription drugs, alcohol intake, and unexpected reactions	Pharmacists collected information not collected by physicians or nurses in 48% of the charts
Gurwich (1983)	Retrospective review of histories for 86 patients interviewed within 24 hours of admission by a physician and pharmacist	Allergies, drug abuse, drug misuse, previous medications that are required during hospitalization, previous medications that could interfere with current therapy, drug-related admission, previous drug-therapy failure, and past drug-related problem	Pharmacists documented average of 5.6 prescriptions/patient, while physicians documented 2.4
Wilson and Kabat (1971)	Retrospective review of physician admission histories and pharmacist histories for 100 patients	Prescription and nonprescription drugs taken in last six months	Physicians recorded 70% and 37% of prescription and nonprescription drugs reported to the pharmacist by the patients

identifying more prescription and nonprescription drugs than nurses and physicians (Barger and Barger, 1976). In a follow-up study in which the nurses used an interviewing form similar to that used by the pharmacists, the nurses identified substantially more drugs. The researchers conclude (p. 93), "...[S]ome of the differences between interviewers in previous studies were obviously the result of a difference in forms used rather than of the competence of the interviewers."

Teaching. Several studies evaluating programs for teaching interviewing to pharmacy and medical students provide additional information about measures of interviewing content and methods of applying them in practice (Table 5).

The Arizona College of Pharmacy program, which used the ACIR-P scale to assess interviewing process, assessed pharmacy students' information-gathering skills using content check lists specific for each simulated history (Gardner and Burpeau-DiGregorio, 1985; Gardner and McGhan, 1986).[2] The simulator assigned each student a content score based on the percentage of points elicited during the interview.

Gardner and Burpeau-DiGregorio (1985) found a 20% gain in content scores between the first and second interviews. In the other study, the content scores for students pretested with the simple history or complex history-1 significantly improved from the first to the second interview (Gardner and McGhan, 1986). The group pretested with complex history-1 had the greater degree of improvement.

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[2]See the previous section for a description of the two educational interventions.

Table 5. Selected Teaching Programs that Assessed Interviewing Content of Medical and Pharmacy Students

Reference	Completeness Measure	Rating Mechanism	Design	Results
Barbee et al. (1967)	12 categories: introduced self and explained procedure, elicited chief complaint, elicited major symptoms, time of onset and etiological factors, location, character and severity, course and duration, relationship to other symptoms and bodily functions, prior medical care and results of therapy, elicited pertinent negatives, determined patient's interpretation of symptoms, and inquired about emotional aspects	7-point scale, where 1 is ideal or completely adequate and 7 is complete omission or totally inadequate	First two and last two interviews of 10 medical students audiotaped and reviewed by three trained and one untrained faculty members	Significant inter-rater agreement (Pearson product moment) among three trained raters; little agreement between untrained and trained raters
Gardner and Burpeau-DiGregorio (1985)	40-item check list specific for the medication history; items divided into three categories: chief complaint and history of present illness, past drug therapy, and social and family history	Items checked if gathered; reported as percent of total points on check list	45 Undergraduate pharmacy students divided into two groups, which interviewed two patient simulators in a crossover design in consecutive four-week periods; patient had hypertension history	Scores increased 20% from first to second interview (scores were 58% and 78%, respectively)

Table 5 (continued)

Gardner and McGhan (1986)	Same as above	Same as above	62 Undergraduate pharmacy students divided into two groups, where group 1 was pretested with simple history and group 2 pretested with complex history-1; all posttested with complex history-2	Group 1 scored 43% and 72% on the pretest and posttest, respectively; group 2's respective scores were 44% and 86%; posttest scores for group 2 were significantly higher than group 1
Rutter and Maguire (1976), experiment 1	9 categories: symptoms, course of the disorder, effect on adjustment, other problems, treatment of current episode, previous episodes, family history previous personality, current support system	Each piece of relevant and accurate information scored one point if it fell into one of the categories	24 Medical students divided into two groups, where group 1 had a training program and group 2 had traditional training; students' written histories reviewed by one of two faculty members	Group 1 obtained median of 35.5 relevant and accurate items of information, compared with 13.5 for group 2
Rutter and Maguire (1976), experiment 2	Same as above	Same as above	Matched pairs of 28 medical students, where half (group 1) had training program and half (group 2) had training program without video-feedback	Group 1 obtained median of 25.5 relevant and accurate items of information, compared with 21.5 for group 2; concluded video-feedback not most important aspect of training

By definition, the content of medication-history interviews deals with medications. In medical histories, however, physicians deal with more topics than just medications. Of the two studies I found that evaluated the content of medical interviews, one used a fact-oriented content rating scheme in which each piece of information judged to be relevant and accurate for one of nine categories was given one point (Rutter and Maguire, 1976). The other used a process-oriented measure of interviewing content that I believe did not clearly distinguish between content and process (Barbee et al., 1967); for example, introduced self and explained procedure was an item in the content measure.

After reviewing deficiencies in the content-gathering abilities of medical students (Maguire and Rutter, 1976), Rutter and Maguire (1976) conducted two experiments designed to evaluate a program for training medical students in history-taking skills. For these two studies, "history-taking skills" refers to medical interviewing content rather than process. In the first study, students who underwent a training program reported almost three times as much relevant and accurate information as those who received only "traditional" training ($p < 0.001$). The training program consisted of 45-60 minutes with an instructor, during which the student received a detailed handout outlining a scheme for history taking, practice under controlled conditions, video-feedback, and advice to "revise symptoms repertories." A second experiment showed that the video-feedback portion of the training program had no effect on the information the students subsequently collected. Instead, just as Barger and Barger (1976) found that a data-collection form accounted for the difference in amount of

information collected by pharmacists and nurses, Rutter and Maguire (1976) suggested that the printed handout may have accounted for the training program's effect.

In the Barbee et al. (1967) study, there was considerable variation in the correlation of each content item with the total content score; the five items correlating most highly ($\underline{r} \geq 0.78$) were major symptoms, location, character and severity, course and duration, and relation to other symptoms. These correlations were the same whether the scores were unweighted or weighted for the raters' assessment of each item's relative importance; therefore, the authors suggest that these five items constitute the most important content areas of the current medical history.

Significant interrater agreement was achieved for the five highest correlated items on the content evaluation form. The importance of using trained raters is shown by the consistent lack of agreement by the untrained rater. In general, rater agreement was better on the content scale than on the previously described interview technique scale. This may reflect the more subjective and individualized nature of interview technique.

Summary. The literature provides information on what items should be incorporated into a measure of the content gathered from medication-history interviews. Most studies assessing the informational outcomes of medication-history interviews have used the completeness approach, but none of these have tested the reliability or validity of their completeness measures.

4. Patient Satisfaction

If a patient's expectations are met, a satisfied patient will generally be the result. Two dominant dimensions associated with meeting patient expectations emerge throughout much of the patient satisfaction literature: providing emotional support and encouraging mutual responsibility and patient autonomy (see, for example, Inui and Carter, 1985). The research that does exist is in medicine; I could not locate reports specifically related to patient satisfaction with medication-history interviewing.

In this section I evaluate selected research dealing with patient satisfaction with medical care that may be useful in developing a measure of satisfaction with medication-history interviewing.

Dimensions of Satisfaction. Previous research indicates individuals are able to differentiate between several aspects or dimensions of satisfaction with their health care (Ware et al., 1975, 1978). These include general or global satisfaction and satisfaction with the cost, convenience, and availability of care; the art of care; technical qualities of care; continuity of care; the communication and information transmitted from the provider; and the efficacy and outcomes of care. Many of these dimensions are interrelated. For example, general satisfaction tends to be moderately to highly correlated with each of the specific dimensions (Doyle and Ware, 1977).

General or Specific Applications. Methods used for tapping patient satisfaction have focused on either a general evaluation of physicians, health-care services, or facility (McCusker, 1984; Hulka et al., 1970; Zyzanski, Hulka, and Cassel, 1974; Stewart and Wanklin,

1978; Ben-Sira, 1976; Doyle and Ware, 1977) or satisfaction with a particular physician, interview, or encounter (Vuori et al., 1972; Korsch research group 1968, 1971, and 1972; Wolf et al.,.1978).

McCusker's (1984) general satisfaction scale provides an example of the former type of measure. The scale consists of four items, each measured on a five-point Likert-type format (1 = strongly agree and 5 = strongly disagree); reliability ranges from 0.75 to 0.87.

1. I'm very satisfied with the medical care I receive,
2. The medical care I have received in the last few months is just about perfect,
3. There are some things about the medical care I receive that could be better, and
4. I have some complaints about my medical care.

As an example of the latter type of measure, Wolf and colleagues (1978) designed a 23-item instrument to measure a patient's evaluation of individual medical interviews from cognitive, affective, and behavioral perspectives. In another study using the "specific-population" approach, Vuori et al. (1972) used patients' report of willingness to return to the same physician as a measure of a successful physician-patient relationship.

Direct Questioning. Another way to differentiate among studies tapping patient satisfaction with health care is to look at how the information is obtained. One basic approach involves direct questioning in a personal interview; the Korsch group (Korsch et al., 1968; Freemon et al., 1971; Korsch and Negrete, 1972) offers a good example of this. The other approach involves written attitudinal surveys (e.g., Hulka et al., 1970; Stewart, 1984; Wolf et al., 1978; Stiles et al., 1979b and 1984).

Direct questioning has two major drawbacks. First, patients may answer questions in a socially acceptable manner, and, therefore, they may infrequently express negative attitudes. Second, responses to direct questions (e.g., "My physician is okay, except...") may not be easily transformed to quantitative scores reflecting the patient's actual satisfaction.

The Korsch group interviewed mothers to learn about their expectations and satisfaction with pediatricians. Patient (mother-child) visits were studied by audiorecording the medical interview, conducting a post-visit interview with the mothers, reviewing patient charts, and conducting follow-up interviews 14 days after the visit.

The satisfaction ratings were based on a combination of what Korsch called "global" impressions recorded by experienced interviewers in the field, responses to questions in the interview directly related to satisfaction (e.g., "How satisfied were you with your visit?"), and responses to questions indirectly related to satisfaction (e.g., "What were some of the things you did not like about your visit with the doctor?"). Other direct questions were as follows (Korsch et al., 1968):

1. Regarding your visit to the hospital, in general, how satisfied were you with it?
2. What were some of the things you liked about your visit with the doctor? What were some of the things you didn't like?
3. Did the doctor seem to understand how concerned you were about [blank]? How did he show it?
4. How did the doctor act, for example, was he more business-like or more friendly, or [what]? How do you think a doctor should act?
5. How well was the doctor able to relieve your worries about [your child's] sickness?
6. How satisfied are you with the way things have been going since your visit here last [blank]?

While the authors state that "this aggregate of items yielded a more internally consistent and reliable rating of satisfaction than any other combination that was devised or tested" (p. 859), this statement was not supported in any fashion.

The Korsch group's results offer several general observations on patient satisfaction. A lack of friendliness from the physician contributed to patient dissatisfaction, and dissatisfaction increased if physicians failed to account for patient concerns and expectations. In addition, use of medical jargon and the lack of clear-cut explanations about diagnosis and cause increased dissatisfaction.

What accounts for the fact that, besides these general findings, these studies do not contribute much to understanding the subtleties of patient satisfaction with medical care? One reason may be that the investigators analyzed the interaction behaviors using a modification of Bales interaction process analysis, which was originally developed to code interactions in groups of college students, not one-on-one encounters (Stiles et al, 1979b). I believe a more salient point, however, is that the investigators' open-ended, direct questioning approach for garnering patient satisfaction leaves much open to interpretation. No explanations were provided on the methods of coding or collapsing the data for categorical analysis. In addition, 14 days elapsed between the visit and follow-up interview, and the design did not control for specific disease states.

Measures Using Subscales. Several studies that used subscales of patient satisfaction measures illustrate the interrelationships among dimensions of patient satisfaction with medical care.

Stewart (1984) studied whether patient-centered interviews were related to medication compliance and patient satisfaction. She operationalized patient-centered interactions as those in which the physician actively sought the patient's point-of-view. Audiotaped interviews of physicians with 140 patients taking one scheduled solid oral medication were analyzed using Bales IPA. Ten days later the patients were interviewed at home to assess satisfaction using a 17-item scale.

According to Stewart, the 17-item scale was derived from a scale developed and shown to be reliable (Hulka et al., 1970; Zyzanski, Hulka, and Cassel, 1974) and valid (Stewart and Wanklin, 1978). The original scale consisted of 42 items divided into three equal parts: the physician's professional competence, cost and convenience factors, and personal qualities of the physician. Stewart's 17-item adaptation of the scale incorporates the 14 items relating to professional competence and 3 items relating to personal qualities. In my view, this overrepresents competence at the expense of affective satisfaction qualities, and this imbalance may be responsible for the finding of no significant difference ($p > 0.05$) in the percentage of patients highly satisfied (as measured on both subscales) when interviewed by physicians demonstrating high and low frequencies of patient-centered behavior. Highly satisfied patients were those whose satisfaction scores were above the 75th percentile.

In another study that used only the 14 items related to the personal qualities of the physician from the same 42-item satisfaction scale, Stewart and Wanklin (1978) found that the level of patient satisfaction significantly increased with the "directness" of the

satisfaction measure. These investigators defined "directness" attitudinally by creating three different versions of the satisfaction scale. In the "direct" version, the items asked patients about feelings about their own personal physician. The "indirect" version asked about feelings about physicians in general, and the "intermediate" version asked about feelings about their health care in general.

Stiles et al. (1979b) explored the association of particular types of verbal exchanges using the verbal response modes method with patients' satisfaction with their medical interviews. How was patient satisfaction measured? Following medical interviews with 1 of 19 physicians, 50 patients completed a satisfaction questionnaire that consisted of 33 items in a five-point Likert-type format (5 = strongly agree and 1 = strongly disagree). From this questionnaire, two satisfaction scales were constructed. Items measuring cognitive satisfaction described the physician's task of giving information and the patient's understanding of it (e.g., "The doctor told me all I wanted to know about my illness"). Items measuring affective satisfaction described the physician's warmth and the patient's feelings of trust (e.g., "I felt this doctor accepted me as a person").

The mean ($\pm$S.D.) cognitive and affective satisfaction scores were 3.87 ± 0.70 and 4.03 ± 0.62, respectively. Cronbach's coefficient alpha for the two respective scales were 0.87 and 0.86. Scores for both scales were significantly correlated ($r = 0.75$, $p < 0.001$). There were no significant relationships of satisfaction scores with age, education, sex, or race.

Summary. General measures of patient satisfaction with medical care have been shown to be as reliable as measures tapping specific dimensions of patient satisfaction. Written self-administered satisfaction measures are preferred over direct questioning since direct questioning may prompt socially acceptable answers and create problems in interpreting responses. Based on my review of the literature, I believe that assessing whether a patient's expectations with a medication-history interview are met would be best measured using a written index of general satisfaction based on the patient's attitudes toward the specific interview and interviewer.

C. Hypothesized Factors Affecting Interviewing Outcomes

1. Overview

I found no theory or research in the pharmacy literature on possible determinants of the medication-history interviewing outcomes of process, content, and patient satisfaction. The relevant literature I did find was in medicine. This scant body of literature, approaches taken in research relating to pharmacist counseling, and assorted findings in medical and nonmedical fields provided fodder for selecting variables that merit a look as potential determinants.

In the following sections I describe these potential determinants, reasons for selecting them, and the scheme for placing them in relation to one another in the models. I organized the discussion of the hypothesized factors as follows:

1. Background characteristics of the interviewer, which includes the student's parents' education, academic ability, and gender;

2. Communication apprehension;
3. Attitudes and values, which includes people and health-care orientation and orientation toward interviewing; and
4. Gender of the simulated patient.

2. Background Characteristics of the Interviewer

Background characteristics of the interviewer hypothesized to influence outcomes of medication-history interviews are the student's parents' education, academic ability and gender. Parents' education and gender of the student are considered exogenous variables; academic ability is entered next as one of the precursory variables.

Parents' Education. The present state of theory concerning the process of status attainment is that social psychological mechanisms may be factors between social characteristics of the family and performance variables (Sewell and Hauser, 1975).

No studies specifically examined the relationship between social class measures (like parents' education and occupation) and the information-gathering ability of physicians or pharmacists. One study, however, showed that physician's social class (as measured by father's occupation) was positively associated with a tendency to give more information to patients (Waitzkin, 1985). It is reasonable to ask whether social class exerts a similar effect on information gathering.

Academic Ability. I uncovered only two studies that assessed the relationship between measures of academic ability and interviewing behavior in a health-care environment. More research is needed, since these limited studies show mixed results.

Ware, Strassman, and Naftulin (1971) found that neither scores on the medical college admission test nor gradepoint average was an effective predictor of the quality of the interviewing behavior of medical students as rated by their clerkship instructors. Barbee and Feldman (1970), however, found that gradepoint average in all four years correlated well with interview performance scores in the senior year, even though performance scores in the sophomore year were significantly correlated only with gradepoint average for the junior and senior years.

Gender of the Student. I found no literature specifically examining the effect of pharmacist gender on interviewing. Even though studies of physicians exist, no definitive statement can be made about the effects of physician gender on the quality of physician-patient interactions or on the nature of patient outcomes (Weisman and Teitelbaum, 1985). Support for examining this variable comes from the available literature relating to (1) the effect of physician gender on physician-patient interactions, (2) gender differences in general, and (3) gender differences in communications.

What is the theoretical rationale for expecting gender effects? Weisman and Teitelbaum (1985) present a thorough look at how physician gender may affect key outcomes, such as patient satisfaction.

First, physician sex differences in personality, attitudes, or interpersonal skills might affect interactions with patients. It is unlikely that professional socialization would completely counteract early sex-role socialization, which is highly resistant to change (Scanzoni, 1975). To the extent that female physicians have been

socialized to the traditional female sex role, they could be more nurturant, expressive, and have stronger interpersonal orientations than male physicians. Male physicians, in the same vein, could be more reserved and less empathic than female physicians.

On the other hand, female physicians have broken sex-role stereotypes to some extent by becoming physicians; therefore, they may be less likely to have traditional views of sex roles than patients. For instance, one study showed that, as the proportion of women physicians increases, the behavior of men and women tends to converge to the prevailing norms of the profession (Weisman et al., 1980).

Second, the expectations patients bring to the encounter may be altered by physician gender. Considerable evidence from patient-satisfaction studies show that patients desire physicians who display an "affective quality" as well as technical competence (see, for example, Wasserman and Inui, 1983; Segall and Burnett, 1980), and patients may now expect and desire female physicians who may be perceived as being more expressive or humane.

Gender, along with other stereotyped status characteristics (e.g., race and parents' education), may be used to channel individuals into particular organizational positions or career paths that offer varied opportunities for mobility, as well as in the structural bases for power. Structural theory assumes that equivalent positions of structural power are sufficient to overcome stereotypes. Molm (1985) examined gender and power use and its relationship to structural theory in a laboratory experiment in which 160 men and women undergraduate students were assigned to different positions of struc-

tural power. As structural theory predicts, actual power use and evaluations of the powerful person were largely unaffected by gender when men and women were assigned to structurally equivalent positions of power. She suggests that the most blatant form of stereotyping--assigning characteristics and attributes to women solely on the basis of their gender--may be changing, but these changes are subtle.

The implications of the experiment for power relationships in natural settings are considerable. For example, if women are in positions in which they can effectively use power (e.g., women pharmacy students conducting medication-history interviews), they will be "evaluated" accordingly (e.g., by patients via measures of satisfaction and by clinicians via measures of performance outcomes).

Other studies suggest a gender-communication link. Women disclose more about themselves than men, especially on intimate topics like sex (Lombardo and Berzonsky, 1979; Higgins, 1981), and women listen while men do most of the talking (Eakins and Eakins, 1978). In a study involving 80 undergraduate volunteers interviewed about intimate and usually confidential material (sexual behavior, antisocial behavior, and love) by one of eight interviewers representing a "helping" professional, Higgins (1981) found that female interviewers elicited more intimate communication from interviewees than did male interviewers. In addition, Higgins found no interaction effect of gender; in other words, female interviewers elicited more information from both male and female interviewees on all topics.

It should be noted that some authors suggest gender effects on behavior may be artifacts of the laboratory or of student subjects

(Osborn and Vicars, 1976; Brown, 1979). According to Osborn and Vicars (1976), the greater control of the laboratory may yield significant gender differences even when such differences account for a very minor proportion of the observed variance.

Two studies peripherally address communication, gender, and pharmacy issues. Pantoja and Fink (1985) examined the attitudes of 23 pharmacy undergraduate and graduate students toward women in pharmacy; 56.3% of the respondents were women. The perception that women are more understanding and work better with the public was more prevalent among women (27.6%) than among men (6.2%). Oliver and Barnes (1983), however, found that female pharmacists were "less secure" than male pharmacists in their perceived abilities to communicate, measured as self-ratings of communication skills as good, average, or poor.

In summary, the literature provides justification for studying the potential effects of pharmacy student gender on the patient's satisfaction with the interview and on the interview process and content, even though no clear statement can be made about the existence or direction of the effects.

3. Communication Apprehension

One factor that may affect interviewing behavior is communication apprehension. Originally described by McCroskey in 1970, communication apprehension is an "individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey, 1977, p. 78). Communication apprehension is considered a personality trait, such that it is characterized

by generalized fear or anxiety about many different types of oral communication situations. This trait is distinguished from state apprehension, which is normal anxiety or fear about specific oral communication situations (commonly referred to as stage fright).

According to Baldwin, McCroskey, and Knutson (1979), a person with a high level of communication apprehension tends to avoid communication much of the time. They posit that a pharmacist with high communication apprehension is expected to talk less with patients than other pharmacists do, even on professional or therapeutic matters. In addition, a pharmacist with high communication apprehension in their view is less likely to be perceived as a credible source of drug information or as an intelligent person.

Berger and McCroskey (1982) note that it is important to keep in mind that communication apprehension represents a cognitive dimension and communication skill a behavorial dimension of the communication process. For example, a person with both excellent communication skills and high communication apprehension will communicate well when necessary but avoid it when possible (Baldwin et al., 1979). According to Berger and McCroskey (1982), a person like this needs training to reduce apprehension, such as cognitive restructuring or systematic desensitization, rather than training to enhance skills.

The personal report of communication apprehension (PRCA) is the most widely used measure of communication apprehension.[3] The instru-

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[3]The PRCA instrument has been published previously (McCroskey, 1978; Berger, Baldwin, McCroskey, and Richmond, 1982; Baldwin et al., 1983).

ment has been shown to be highly reliable and valid.[4] While this questionnaire is designed as a measure of the subjects' cognitive orientation toward communication and not as a measure of actual behavior, numerous studies have indicated the high association of PRCA scores with communication behavior as defined by the researchers. For example, it is highly associated with the amount of talk the individual is willing to produce and the likelihood of an individual withdrawing from or avoiding communication situations (McCroskey, 1970 and 1978). These associations of PRCA scores with specific behaviors suggest that the measure has merit as a possible predictor of the behavioral outcomes of medication-history interviewing in this study.

In a national study of 9830 pharmacy students, about one of five (20%) reported high communication apprehension, which is similar to the percentage in the general population (Berger, Baldwin, McCroskey, and Richmond, 1983).[5] When the pharmacy students were categorized by the variables sex, race, and hometown size,[6] statistically significant differences were detected using Student's t tests and F tests; for

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[4]Instrument reliability for a study of pharmacy students was 0.92 (Baldwin, McCroskey, and Knutson, 1979); test-retest reliability was 0.76, which indicated the stable enduring nature of communication apprehension.

[5]The mean ($\pm$ S.D.) PRCA score for the general population was 65.6 $\pm$ 14.1 ($n \geq 40{,}000$); for 9830 undergraduate pharmacy students it was 65.15 $\pm$ 16.28. A high level of communication apprehension is computed to be one standard deviation above the mean for the general population (McCroskey, 1978). So, a result greater than or equal to 79 is high communication apprehension.

[6]The variable race was categorized as white, Black, Oriental, Native American, and Hispanic; hometown was categorized as farm, less than 5,000, 5,000 to 50,000, and large city or suburb.

practical purposes given the large sample size, however, there are no substantially significant differences in these scores.

Berger and colleagues (1983) present some interesting results and interpretations about the relationship between communication apprehension scores and perceived importance of three types of communication (interpersonal, group, and public speaking). Pharmacy students who value each type of oral communication as "very important" consistently had the lowest--least apprehensive--mean communication apprehension scores. Conversely, for all except interpersonal communication, lower perceived importance was associated with higher communication apprehension scores. Berger et al. (1983, p. 98-9) interpret these findings by stating, "The higher the amount of anxiety produced by a communication context for an individual, the less that type of communication will be valued." To explain the noted exception of interpersonal communication, the authors assume that "...interpersonal communication is less threatening than group which is less threatening than public speaking."

I believe that assumption regarding the perceived threat of interpersonal communication and its relationship to the PRCA index is unfounded. PRCA scores cannot be expected to correlate well with perceived value of interpersonal communication because the 24-item PRCA index contains at most 6 items relating to interpersonal communication; the remaining items have more in common with the other two similar categories of communication (group and public speaking) than with interpersonal communication.

A major drawback of the work with pharmacy students by Berger and

colleagues (Berger and McCroskey, 1982; Berger et al., 1982, 1983; Baldwin, McCroskey, and Knutson, 1979; Baldwin et al., 1983) is the focus on communication apprehension as a single descriptive or predictor variable. While their studies show that communication apprehension should be studied as one possible factor explaining communication behaviors, I do not believe it alone is the primary factor explaining those behaviors. As McCroskey notes (1977), the communication apprehension trait is established through early childhood socialization; as such, it is possible that the background characteristics of parents' education and interviewer gender may affect communication apprehension. However, by using only a personality approach to explaining communication behaviors, the direct effects of those background characteristics would be ignored, as would be the effects of characteristics developed through professional socialization, such as attitudes.

Because communication apprehension may be influenced by the exogenous determinants of parents' education and student's gender, communication apprehension follows these as one of the precursory determinants in the path models.

4. Attitudes and Values

I hypothesize that people and health-care orientation and interviewing orientation can help explain the medication-history interviewing behavior of pharmacy students. Since no relevant literature exists on the relationship of attitudes and values to information gathering, support for examining these hypotheses comes from research relating to information giving by physicians and pharmacists.

These hypotheses represent a global social psychological approach for viewing relationships. One value of the social psychological perspective is that it is dynamic and formative, not static. Its focus is on interaction with others, and through these interactions individuals acquire the behaviors, knowledge, attitudes, beliefs, and values of the group they come from or aspire to be identified with (Merton, Reader, and Kendall, 1957). The socialization process accomplishes the implicit goal of inducing members to behave in accordance with norms.

An attitude is a "relatively stable affective predisposition" to respond in a particular way toward a person, object, or issue (Muldary, 1983, p. 209); "relatively stable" means that attitudes tend to endure over time. According to this definition, attitudes are unobservable cognitive or emotional processes that function like "inclinations" or orientations toward some person, object, or issue.

How are attitudinal orientations related to values? One possibility according to Rokeach (1973) is that values can serve as criteria for choices and judgments through which an individual develops attitudes. Thus, a student's attitude toward a health profession and its tasks may be influenced by the degree to which "helping," "health," "health care," "working with people," or some other criterion is an abstract value.

Reason for choosing pharmacy as a major may reflect a student's values or orientation to the profession. Researchers have identified a variety of reasons students major in pharmacy (see, e.g., Smith, Gibson, and Mikeal, 1974; Kirk and Ohvall, 1975), and I group these

reasons as follows: career, career mobility, and job prospects; technical subject matter of the profession; and humanistic or helping orientation. Of these, only the reason of humanistic or helping orientation reflects a professional practice orientation and an interest in interpersonal relationships, and thus it may be a potential determinant of interviewing outcomes. That is, if a student values working with people and being in a health-care profession, that value may have a positive effect on the student's attitude toward being oriented to the profession and its tasks, including medication-history interviewing.

Following Rokeach's reasoning, in the models I temporally placed the more abstract value concept of "people and health-care orientation" before the more concrete attitudinal concept of orientation toward interviewing.

While it has often been assumed that physicians' attitudes about giving or gathering information affects physicians' communication behavior, few studies examine the attitude-behavior relationship. Waitzkin (1985) provides some evidence of an association between physicians' attitudes about patient communication and behavior when it comes to information giving; physicians who held attitudes favorable to informing patients tended to transmit more information.

One study examined the effect of attitudes on pharmacists' counseling behavior (Mason and Svarstad, 1984). Rural community pharmacists were visited on two occasions by a different unknown observer who presented a prescription for one of two different prescription

drug products. Indices were constructed to quantify the extent to which pharmacists provided written instructions, provided verbal instructions, interviewed patients, and acted in an approachable manner. For the purpose of Mason's study, interviewing behavior consisted of inquiries intended to solicit information from the patient to identify medication-use problems or to assess the patient's understanding of instructions for taking the medication or of other pertinent information. The pharmacist's attitude toward counseling was measured during a preceding interview using a counseling role orientation (CRO) scale developed by Mason (1979).

Although the correlations between counseling attitude and interviewing behavior and between counseling attitude and approachability were statistically significant (r = 0.2 and 0.28, respectively; $p \leq 0.05$), the magnitudes of these associations were relatively small. The extent to which pharmacists provided verbal instruction correlated most positively with counseling attitude (r = 0.54, $p < 0.001$).

Mason and Svarstad mention several possible causes of the weak correlation between counseling attitude and interviewing behavior, one factor being the different role requirements for pharmacists working in community, ambulatory, and clinic pharmacy settings. For example, community pharmacists may have few opportunities to interview or counsel patients, while pharmacists in clinics may conduct medication-history interviews routinely. The authors argue that neglect of the attitude-behavior relationship might explain the lack of consistency among empirical studies that identify relationships between selected

variables and pharmacist counseling activities.[7]

Accepting Waitzkin's approach in medicine and Mason's approach in pharmacy, I believe it is important to control for value and attitudinal factors to help understand and explain potential differences in the outcomes of medication-history interviews.

5. Gender of the Simulated Patient

While the other factors hypothesized to influence the medication-history interviewing outcomes relate to characteristics or behaviors of the interviewer, gender of the patient can be considered a situation-specific background characteristic of the interview that may have an effect on interviewing process and content. Also, patient gender may have an effect on the patient's satisfaction with the nontherapeutic aspects of the interview.

Gender might affect the provider-patient relationship by altering the status relationship of the two parties. For instance, Freidson (1970) argues that same-sex dyads in physician-patient interactions are presumed to have greater status congruence than opposite-sex dyads. The resulting greater status congruence may enhance mutual participation by providing a basis for more free communication, including more self-disclosure (DiMatteo and DiNicola, 1982). Higgins (1981), however, found no interaction effect between participants'

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[7]For example, the amount of time spent counseling patients has been shown to vary by the type of product (prescription or nonprescription) dispensed (Dickson and Rodowskas, 1975), privacy of counseling environment (Ludy et al., 1977; Beardsley et al., 1977), and patient's educational level and drug expenditures (Carroll and Gagnon, 1983).

gender when interviewers representing a helping professional interviewed students on intimate topics; women interviewers elicited more information from both male and female respondents.

By including gender of both the patient and the pharmacy student interviewer as exogenous determinants in the model, the possibility of interaction effects of gender on interviewing outcomes can be studied.

D. Simulated Patient Approach

Many studies discussed in the interviewing outcome section of this chapter involved the use of simulated patients. My study, too, uses simulated patients as the respondents in the pharmacy students' medication-history interviews.

Barrows, a neurologist and teacher, conceived the idea in 1962 of using simulated patients in medical training as a way to overcome instructional problems with "real" patients (Barrows and Abrahamson, 1964). A simulated patient is a healthy individual who has been trained to reproduce historical, emotional, and, in some instances, physical aspects of an actual history accurately. In general, a simulated encounter involves the use of either nonpatients or patients with stable clinical findings in a carefully controlled situation such that meaningful evaluation of student performance is possible.

The validity of patient simulators is addressed in various physician-patient models. For instance, Sanson-Fisher and Poole (1980) found no difference in interviewing or physical assessment skills of medical residents when evaluating actual patients or simulated counterparts. Similarly, other investigators found comparable results in

the physical assessment and interviewing skills of medical students who examined gynecologic patients or simulators (Vontver et al., 1980; Livingstone and Ostrow, 1978).

Helfer (1970) and Helfer and Hess (1970) developed a unique simulation program that focused on interviewing rather than physical assessment skills. Several mothers of pediatric patients were taught to provide a consistent history of a common pediatric problem. A score sheet enumerated the historical information the student could elicit by interviewing the mother. The student's "content" score was based on the amount of data elicited versus the amount of information the mother was trained to provide. This was one of the first specific, objective evaluation instruments to be used in conjunction with a simulated interview encounter.

Helfer's research formed the basis of investigations by Stillman and colleagues at the University of Arizona College of Medicine. Stillman used a similar model involving check lists of information content, but she went on to develop a separate rating scale measuring interviewing process--the ACIR scale discussed earlier in this chapter (Stillman et al., 1977 and 1983). The use of such tools to measure interviewing process and content objectively has become a standard part of the simulated patient encounter.

Stillman and colleagues (1977 and 1983) believe that, when simulators are used in educational programs, they are an integral part of interviewer improvement, training, and teaching. They say that if interviewers are exposed to the criteria of the ACIR scale, exposure alone may raise the interviewers' scores, but "probably not" to the

same extent as the interview itself or a feedback session with a trained patient-simulator-teacher.

While most of the work with patient simulators has been done in medical education, two research groups describe the use of patient simulators in pharmacy education (Giannetti and Nardini, 1981; Gardner and Burpeau-DiGregorio, 1985; Gardner and McGhan, 1986). Unlike my study, these pharmacy applications (along with most of the medical applications) generally involve small groups of students; focus on the technique only as a teaching tool; use one or two patient simulators who act as teacher, evaluator, and feedback source; have no independent rater evaluation of the students; do not study factors affecting behavior; and use various measures of effectiveness.

While clerkship and pharmacy practice experiences are desirable because they involve actual patients, they cannot be standardized beyond very broad guidelines, and this limits in-depth evaluation of student performance. Patients make poor subjects for controlled student evaluation because their histories, physical complaints, and descriptions of the same complaint may vary from one examiner to the next.

Without consistent performance from the patient, it is impossible to provide the same learning experience to each student or to assess student performance, not to mention the difficulty in retaining internal validity standards for the study of factors affecting the interviewing behavior. A disadvantage of simulated patients, however, is that it may be difficult for students to approach them seriously.

E. Research Needs and Proposed Models

1. Summary and Research Needs

While previous research has focused on the interviewing outcomes of process, content, and patient satisfaction in patient-professional interactions, none has specifically examined these outcomes and their interrelationships in the context of medication-history interviewing by pharmacists. In particular, interviewing process has most often been considered an outcome variable, while the literature suggests that process may influence other interviewing outcomes. In addition, the effect of interviewer and respondent characteristics on these outcomes has not been explored. Research is needed to examine these relationships since only by identifying and studying the interviewing interaction as a whole will the pharmacy profession acquire information for reassessing pharmacists' interviewing role.

Further research is also needed to develop valid, reliable, and practical measures of interviewing process, interviewing content, and patient satisfaction. Specifically, I see a need for developing a global measure of interviewing process with the following characteristics. First, the measure should use a continuous multiple-point scale for assessing level of performance for each item. Most measures of interviewing process used in previous research are based on a dichotomous response, such as yes or no, or some other forced-choice response that does not allow for gradation in scoring (Foley and Sharf, 1981). Measures using a multiple-point scale have the potential for detecting greater variation in skill.

Second, the measure should provide an overall view of the inter-

viewers' skills, as in a summed score of the ratings for all items. Such a continuous variable is necessary for applications where the process measure is just one part of a multifactor model; single-item scores would not be practical in explaining the outcomes of patient satisfaction and interview completeness.

Third, the measure should be designed specifically for medication-history interviews. Other process evaluation forms--even those like the ACIR scale that are not single-item measures--do not tap the unique nature of the medication-history interview.

Turning to research needs related to measures of interviewing content, I believe it is desirable to develop a measure that has the convenience of a check list without being tied to a specific medication history; this will make the measure useful when evaluating any medication-history interview. Also, since it is not possible to predict in advance what piece of information is important for a specific patient's history, all points of information in the measure should be weighted equally. The measure should give points for the interviewer's attempt to gather specific content points, even when the answer is "no;" many measures used in previous research give points only for affirmative responses.

No literature specifically assesses patient satisfaction with medication-history interviewing. I believe the research priority should be on developing and testing a written, self-administered index of general satisfaction based on the patient's attitudes toward the specific interview and interviewer.

Future research designs should use raters--not participants--to

observe and assess the interviewing outcome measures, so that problems of using participants as raters are minimized (Stewart and Cash, 1985). Instruments developed with this in mind would be applicable in both research and educational situations, if desired. Raters should have the same interviewing orientation and training as the interviewers they evaluate.

2. Description of Models and Hypotheses

As stated in the introduction to this chapter, the purpose of my research is to study factors affecting the outcomes of medication-history interviews by pharmacy students. The study aims to determine whether pharmacy students' performance on a medication-history interview, measured using instruments developed to score levels of interviewing content and patient satisfaction, can be explained by structural equation models that include background, value, and attitudinal characteristics of the interviewer; gender of the interviewer and patient; the communication apprehension of the interviewer; and the interviewing process of the interviewer. The study design uses simulated patients as the respondents.

A secondary purpose of the study is to develop and test instruments for measuring interviewing process and patient satisfaction and to test an instrument for measuring interviewing content.

Based on my review of the literature, I propose two separate but related models of medication-history interviewing by pharmacy students (Figure 1); the variables used in the models are defined in Table 6. In one model, the dependent variable is patient satisfaction; in the

Figure 1. Temporal Model of Medication-History Taking[a]

Exogenous	Precursory	Attitudinal	Interviewing Outcomes	
Gender of interviewer	Orientation to pharmacy	Attitudes toward interviewing	Interviewing process	Interviewing content
Parents' education	Apprehension toward communication			Respondent satisfaction
Gender of respondent	Academic ability			

[a]The far right column shows the dependent variables of interviewing content and respondent satisfaction. Two models of interviewing behavior will be tested, with each dependent variable run separately. Each of the other columns present the variables entered in each model simultaneously; the temporal order moves from left to right.

Table 6. Definitions of Variables in the Models

Variable	Definition
Gender of interviewer	Sex of the pharmacy student interviewer
Parents' education	Level of education attained by the student's parents
Gender of respondent	Sex of the simulated patient
Academic ability	Cumulative gradepoint average in prepharmacy courses
Apprehension toward communication	Personal report of communication apprehension (PRCA)
Orientation to pharmacy	Reason for choosing pharmacy as a major
Attitudes toward interviewing	Attitudes toward medication-history interviewing
Interviewing process	Measure of interview skill
Interviewing content	Measure of interview completeness
Respondent satisfaction	Simulated patient satisfaction

other it is interviewing content. Other than that, both models are identical.

Each model has nine determinants, three exogenous and six endogenous. Background determinants included are the interviewer's gender, a measure of academic ability, and parents' education. The effect of the simulated patient's gender is also controlled, and the possibility of an interaction effect between simulated patient's gender and interviewer's gender is tested. Since communication apprehension has been associated with some communication behaviors, it is included as a potential predictor of the interviewing outcomes in these models as well. The effect of the interviewer's attitudes and values, specifically orientation to pharmacy and attitudes toward interviewing, are also included. The concept of interviewing process, which in many studies is the only outcome variable, is included as the final factor in the models.

It is hypothesized that these variables as shown in Figure 1 will have a significant impact upon interviewing content and a significant impact upon respondent satisfaction with the interview. Figure 1 shows the temporal order in which the variables will be entered in the path models.

While the literature provides justification for identifying these potential determinants of the outcomes of medication-history interviews by pharmacy students, it provides little clear support for hypothesizing the direction of all of the relationships between them. Therefore, no such hypotheses are made.

Three factors prompted my use of two models of interviewing

behavior. The first and major factor results from my interest in testing temporally-constant relationships of the previously specified determinants with separate dependent variables representing outcomes from two different perspectives--interviewing content from the eyes of pharmacists and respondent satisfaction from the eyes of patients. At the same time, by placing interviewing process as the final factor in the models, the effect of interviewing process on the two outcomes can be easily determined.

The second factor relates to the maximum number of variables in a model. As a general rule in multiple-regression analysis, it is desirable to have at least 10 valid cases for each variable used in the analysis. In this study, the number of valid cases for some variables hovers around 90, and, therefore, no more than nine variables should be included. Using two models of nine variables each alleviates the problem of not enough cases for a single 10-variable model.

The final reason for using two separate models relates to ease of interpretation. Although it is acceptable to have two dependent variables in one structural equation model, the number of potential and resultant paths make visual as well as written interpretation much more difficult. Plus, the issue of multicollinearity[8] has to be addressed with any temporally loaded variables.

I believe my models provide a more realistic, externally valid

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[8]Multicollinearity refers to the situation where two or more variables are highly interrelated. The problem of multicollinearity can be overcome by including only one of the correlated variables in the model or by substituting a new variable that is a composite of the set of troublesome variables.

approach to medication-history interviewing than approaches used in previous research. As shown in the literature review, pharmacy practitioners have been primarily concerned with the content portion of interviewing behavior. Pharmacy needs to be concerned with not only the all-important content of the interview and the process of interviewing, but also with the patient's satisfaction with the interview. Patient satisfaction at the interviewing stage is one component of motivation that may be important at a subsequent counseling or monitoring session.

CHAPTER 2

METHODS

A. Description of Sample and Interviewing Module

The data for this study consisted of a sample of 112 undergraduate pharmacy students. These students represented the entire class taking the required course, "Social Studies in American Pharmacy," at the University of Wisconsin School of Pharmacy in Fall 1984. The course is offered in the fourth year of a five-year bachelor of science curriculum (two years prepharmacy, three years pharmacy) and emphasizes theoretical and practical applications of social and behavioral pharmacy principles.

As part of this course, I prepared and delivered a four-hour lecture module on basic interviewing and communication skills. The four hours of in-class discussion, held in groups of 30 students or less, consisted of the following:

1. Didactic information on general interviewing principles;[1]
2. Viewing of two commercially available educational videotapes discussing the importance and application of various communication principles (Appelbaum, 1984; Barnard et al., 1982);
3. Limited roleplaying using nonpharmacy and pharmacy exercises;
4. Discussion of both medication-history interviewing and medication (discharge) counseling, since both activities would be expected of the students during the required fifth-year inpatient clerkship experience;

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[1] I developed and distributed a primer containing the basics of medication-history interviewing for pharmacy students.

5. Discussion of applying the upcoming medication-history interviewing experience to all facets of communication and sites of pharmacy practice; and

6. A technical explanation of my research project.

Each student was required to conduct an individual medication-history interview with one of two simulated patients who were unknown to the students. The interview was a course requirement,[2] but being a subject in the research project was voluntary at some stages. Students were given an informed consent agreement to sign if they wished to take part in the attitudinal survey portion of the study. A copy of the agreement is in Appendix A. In other words, completing the interview itself was mandatory, but completing certain survey instruments was either a voluntary in-class activity or depended on the informed consent agreement.

The students, then, were aware of the class exercise and some technical details of the study. These details related more to when, where, and what-to-do to complete the interviewing class exercise than when, where, and how-to-do the interview. My research project was only tangentially related, at best, to issues associated with teaching communication skills or testing and evaluating communication-skill teaching methods. For methodologic completeness, though, I will elaborate on some of the details.

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[2]Two course requirements were actually in force. One, as I mentioned, was completion of the interview. The other, which is not part of this study, was to attend a feedback-review session. All 112 students individually watched and discussed their videotaped interviews with me two to three weeks after completing them. Points were awarded toward the student's final grade in the course for completing both requirements, but no letter grade was assigned to the interview.

To mimic a realistic clinical setting in which interviewers generally have some background information (albeit limited in some cases), the students were given in advance some information about the patient they would be interviewing. The students were told the patient was taking a "thiazide diuretic," and I suggested they become familiar with the pages on thiazides in the United States Pharmacopeia Dispensing Information--1984 (1983). A handout described some points about the patient's social and family history (Appendix B).

The students were also given instructions on how and when to get to the interview site and a copy of a medication-history collection form to record the information they gathered. The collection form was used for authenticity, since the students would use the same one the next year during the inpatient clerkship course. The students knew that their interviews would be videotaped unobtrusively and that the patient they would interview was a simulated patient. I told them they would be given the name and age of the patient immediately before the interview.[3] The time limit for each interview was set at 15 minutes.

B. Description of Interviewing Method Using Simulated Patients

One man and one woman interchangeably served as the simulated patients in this study. The simulators memorized and rehearsed their free-flowing scripted history (see Appendix C) until they each felt comfortable with it and provided consistent information to the

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[3]The fictitious names were Mr. Jonathan Cannon and Mrs. Louise Jefferson; their nonfictitious ages were 30 and 32, respectively.

rehearsal interviewers. Both previously worked as a simulator for the University of Wisconsin Medical School, and they were paid $6 an hour for participating in my project. The simulators were split approximately equally between the 112 students.

To avoid fatigue, each simulator did no more than six consecutive interviews. After each interview, the simulator completed a satisfaction report. Five-minute breaks between interviews were built into the schedule. The student-interviewers had no contact with the simulator before or after the medication-history interview.

In general, the history had the simulated patient currently taking one prescription medication (a thiazide diuretic) for hypertension and two nonprescription medications. The patient also was allergic to penicillin and had difficulty complying with the prescription drug regimen. The specific compliance problem alternated between leg cramps and nighttime urination. Simulators were taught pertinent medical, pharmaceutical, and pharmacological information that pertained to the history, and they were coached to respond to any imaginable question the students might ask.

The medication-history interviews took place in a psychomotor research laboratory equipped with a one-way mirror at the School of Nursing located in the University of Wisconsin Clinical Science Center. The interview room was appointed with a table and two chairs made to represent a private ambulatory-setting interview or consultation room. Videotape and sound equipment, equipment operators, and I (the gatekeeper) were behind the one-way mirror during the interview.

The students picked their own day and time for the interview

within a generous two-week window of possibilities. This offered as natural a randomization as possible. Each student reported to the interview site 15 to 30 minutes before the scheduled interview.

I ushered each student into an anteroom near the interview site and, if the informed consent agreement was signed, administered the 34-item medication-history and interviewing attitude survey. Whether students completed the survey or not, there was enough time for them to prepare themselves before the interview began. When it was time for the interview, I ushered the student to the interview room, opened the door, attached a microphone to the student's lapel or collar, and then left, shutting the door before making my way into the observation area. The videotape operator began recording as soon as the student came into the camera's view. Immediately after the interview, I ushered the student out of the room and into the hallway where each student completed a mock medical-record report on the interview's medical outcomes using the medication-history collection form distributed in class.

A wall clock in the interview room enabled the student to keep track of time. If the interview went to the 15-minute limit, I knocked on the interview room door as a signal for the student to conclude the assignment; only two students received a 15-minute warning. Since I established a time limit and the patient history was not lengthy, I am not interested in length of the interview as a determinant of interviewing outcomes.

I attempted to control for after-the-fact discussion among students by using two patient simulators (one male and one female),

having some flexibility with the history by making it free flowing and unscripted, alternating two "compliance problems" with the thiazide diuretic (Appendix C), encouraging professional conduct regarding patient confidentiality, and keeping the students from returning to the anteroom after the interview.

C. Study Instruments and Measures of Variables

Variables used in the model of factors affecting medication-history interviewing behavior were extracted from five study instruments:

1. The communication apprehension survey containing the personal report of communication apprehension (PRCA) and other course-related questions,
2. The medication-history and interviewing attitude survey containing background questions and the interview orientation scale,
3. The patient simulator satisfaction report,
4. The interviewing content evaluation form, and
5. The interviewing process evaluation form.

The following sections describe each of these instruments, method of development and administration, and variables extracted from each. Table 7 summarizes the sources of data for constructing the variables.

1. Communication Apprehension Survey

The questionnaire containing the 24-item self-report index of communication apprehension was administered in class seven weeks before the student's actual interview (Appendix D). Participation was voluntary. Besides the PRCA scale, this questionnaire included

Table 7. Sources of Variables

Study Variables	Source of Measure
Parents' education	Attitude survey
Gender of interviewer	Attitude survey, student interviewer
Prepharmacy GPA	Attitude survey
Communication apprehension	Communication apprehension survey
Reason for choosing pharmacy as a major	Communication apprehension survey
Interview orientation	Attitude survey
Interview completeness	Interviewing content evaluation form
Interview skill	Interviewing process evaluation form
Patient simulator satisfaction	Patient simulator satisfaction report
Gender of patient simulator	Patient simulator

several items aimed at collecting information pertinent to the study or to the course. One such item and study variable, reason for choosing pharmacy as a major, was on this questionnaire.

The personal report of communication apprehension was scored as follows: (1) strongly agree, (2) agree, (3) undecided, (4) disagree, or (5) strongly disagree. The 24-items were presented in the same order as in numerous references [see, for example, Baldwin et al. (1983)]; Table 8 lists the items, along with directions for computing a final PRCA score. Of the 24 items, 12 are reverse-coded to combat acquiescent response bias, which is the tendency to agree with items regardless of content.

The personal report of communication apprehension scale has been used often with proven validity and reliability over frequent administrations (Baldwin, McCroskey, and Knutson, 1979; Berger and McCroskey, 1982; McCroskey, 1970 and 1977). Most previous researchers, however, categorize the communication apprehension scores as high, low, or normal by establishing ranges based on the standard deviations (Berger and McCroskey, 1982; McCroskey, 1970 and 1977). In my analysis, I will keep the variable continuous to enable more finite and parametric interpretations.

The item "reason for choosing pharmacy as a major" represents an operationalization of orientation to pharmacy. The students were given the following choices for this item:

1. Thought there would be good job opportunities,
2. Liked working with people and wanted to be in a health profession,

Table 8. Items in Personal Report of Communication Apprehension Scale[a]

1.*	I dislike participating in group discussions.
2.	Generally, I am comfortable while participating in group discussions.
3.*	I am tense and nervous while participating in group discussions.
4.	I like to get involved in group discussions.
5.*	Engaging in a group discussion with new people makes me tense and nervous.
6.	I am calm and relaxed while participating in group discussions.
7.*	Generally, I am nervous when I have to participate in meetings.
8.	Usually, I am calm and relaxed while participating in meetings.
9.	I am very calm and relaxed when I am called upon to express an opinion at meetings.
10.*	I am afraid to express myself at meetings.
11.*	Communicating at meetings usually makes me uncomfortable.
12.	I am very relaxed when answering questions at meetings.
13.*	While participating in a conversation with a new acquaintance, I feel very nervous.
14.	I have no fear of speaking up in conversations.
15.*	Ordinarily, I am very tense and nervous in conversations.
16.	Ordinarily, I am very calm and relaxed in conversations.
17.	While conversing with a new acquaintance, I feel very relaxed.
18.*	I'm afraid to speak up in conversations.
19.	I have no fear of giving a speech.
20.*	Certain parts of my body feel very tense and rigid while I give a speech.
21.	I feel relaxed while giving a speech.
22.*	My thoughts become confused and jumbled when I am giving a speech.
23.	I face the prospect of giving a speech with confidence.
24.*	While giving a speech I get so nervous, I forget facts I really know.

[a]Respondents answered using a modified five-point Likert scale, where 1 = strongly agree and 5 = strongly disagree. The items marked with an asterisk were reverse coded in computing PRCA scores.

3. Liked subjects such as chemistry and thought pharmacy would be challenging, or

4. Other.

For data analysis, the variable was structured into a dichotomized dummy variable (1 = people and health-care oriented and 0 = all others).

2. Attitude Survey

Students who signed an informed-consent agreement completed an attitude survey 15-30 minutes before their scheduled interviews (Appendix E). This survey contained several questions regarding the student's background and 34 items measuring the student's attitudes toward interviewing.

The attitude items were styled after Mason's (1979) counseling role-orientation scale. A modified five-point Likert response scale was used, ranging from 1 (strongly disagree) to 5 (strongly agree). To minimize acquiescent response set, the questionnaire balanced the number of positively and negatively phrased items comprising the attitude dimension.

Several faculty members reviewed the 34-item scale for face validity before its administration to students. To select items that would contribute to a reliable instrument, scores on each item were correlated post hoc with total scores on the combined 34-item test for the pharmacy students. The internal consistency reliability as measured by a standardized alpha coefficient was 0.8089. Performance of each of the attitude items was examined using descriptive statistics,

item-to-total correlations, and Cronbach's alpha (Nunnally, 1978). This was done by performing principle factor analysis with varimax rotation in conjunction with my examination of the item-to-total correlations and Cronbach's alpha coefficient.[4]

Items having the lowest item-to-total correlation were eliminated until 13 remaining items had an internal consistency of 0.8061. This process demonstrated that if items not highly correlated with each other were removed, then a reliable instrument for the assessment of attitudinal orientation toward medication-history interviewing could be constructed. The 13 items comprising the interview orientation variable used in the model are listed in Table 9.

Included on this attitude survey were items assessing other study variables, namely parents' education, gender of the student interviewer, and prepharmacy gradepoint average.[5]

Parents' education (for mother and father) was indicated by the student selecting from the following ordinal categories: (1) 8th grade or less; (2) 9th, 10th, or 11th grade; (3) 12th grade (graduated from high school); (4) completed 1-3 years of college or technical school; (5) graduated from college (B.S. or B.A.); (6) had some post-

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[4]The results of the factor analyses and item-to-total correlations are not reported here. With few exceptions, the items retained by the factor analyses were the same as those retained by concurrently evaluating item-to-total correlations and Cronbach's alpha. I based my decisions on qualitative and quantitative grounds by comparing results after completing each procedure.

[5]The attitude survey included measures of other background characteristics that were not included in the model. Some potential determinants were automatically excluded because they showed no variation in the sample; these were the student's marital status, age, citizenship, and primary language.

Table 9. Items in Interviewing Orientation Scale[a,b]

1.	Doing a medication-history interview has value.
5.	Conducting medication histories is a necessary part of the pharmacist's job.
6.	A good interviewer uses eye contact to help build patient trust.
10.	A good interviewer should probe a patient's motivations.
12.	To complete a successful interview, it is important to understand why patients do not take their medications.
13.	Introductions using the patient's and my name will assist in my developing good rapport with the patient.
17.*	The medical and social information I gather from a medication interview is not important because it is usually available elsewhere.
19.	A good interviewer explains to patients why the interview is being conducted.
20.	A medication interview is necessary to gather medical and social information about the patient.
25.	Paraphrasing to clarify a patient's responses is necessary for a successful interview.
26.	Good closure of an interview establishes opportunities for patient feedback.
30.	Being attentive to nonverbal cues will facilitate the interview.
31.	Perceiving a patient's point of view is a necessary skill for a good interviewer.

[a]Respondents answered using a modified five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. The item marked with an asterisk was reverse coded in computing interviewing orientation scores.

[b]The number preceding each item refers to its order in the 34-item attitude scale in Appendix E.

graduate training; and (7) don't know. The resultant distribution led me to collapse categories 1 and 2 into (1) less than high school graduate; the variable then ranged from 1 to 5, with "don't know" responses coded as missing data. Because preliminary analyses indicated that father's education offered more potential explanatory power than mother's education, mother's education was eliminated in the final analysis.

The students indicated their gender on the survey form. Gender was coded as 1 for female and 0 for male. Prepharmacy gradepoint average was self-reported on a 0.00 to 4.00 scale similar to many college and university cumulative grading systems, where 4.00 = A, 3.00 = B, 2.00 = C, 1.00 = D, and 0.00 = F. A self-report of gradepoint average may be inflated, but I assume the inflation, if it exists, is uniform. Also, this is the only choice I had since I did not obtain informed consent to inspect student academic records.[6]

3. Patient Simulator Satisfaction Report

Patient satisfaction refers to whether the patient's expectations are met. In this study the patient simulator satisfaction report served as the index of the simulated patient's general satisfaction with the interview and interviewer (Appendix F). The report consisted of 18 items that I designed to address the simulated patient's attitudes toward the interview and interviewer. The items

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[6]The interview orientation survey asked the student to report prepharmacy gradepoint average and cumulative gradepoint average. I used prepharmacy gradepoint average since it fit the temporally constructed model of interviewing behavior more adequately.

were styled after the work of Stewart and Wanklin (1978) and Wolf et al. (1978). Several faculty members reviewed the instrument for face validity before its use by the two simulators.

The simulators completed the satisfaction report immediately after each interview. Items were measured on a modified Likert scale, where the values were (A) strongly agree, (B) agree, (C) uncertain, (D) disagree, and (E) strongly disagree. Remedies to avoid an acquiescent response set were applied.

As for the interview orientation scale, psychometric analysis was conducted on the 18-item scale. Performance of each satisfaction item was examined using descriptive statistics, item-to-total correlations, and Cronbach's alpha (Nunnally, 1978). The interval consistency reliability for the 18-item scale was 0.9218. Items having the lowest item-to-total correlation were eliminated until the 12 remaining items had an internal consistency of 0.9193. The 12-item scale used for analysis is presented in Table 10. The total score was computed in a positive manner on a 1 to 5 scale with the most "satisfied" response receiving the highest score of 5 and the least "satisfied" response receiving a score of 1. The total scores could range from 12 to 60.

4. Interviewing Content Evaluation Form

Interviewing content, defined as interview completeness, refers to the amount of information gathered from an interview. The interviewing content evaluation form in Appendix G, which was developed by Okubo (1986) as an independent component of my project, was the source of the behavioral measure of interview completeness.

Table 10. Items in Patient Simulator Satisfaction Scale[a,b]

1.	The purpose of the interview was made clear.
2.	The questions or statements were clearly stated, for the most part.
4.	The interviewer was a good listener.
5.*	I felt uncomfortable; rapport with the interviewer was not good.
6.	I felt free to be honest and candid.
7.	I felt free to offer my own ideas.
9.	The interviewer articulated and enunciated clearly.
11.*	The interviewer did not respect me or my problems.
12.*	The treatment given to me by the interviewer was impersonal.
15.	I felt warmth from the interviewer.
17.	For the most part, the interviewer used appropriate eye contact.
18.*	The interviewer was nervous and uncomfortable.

[a]Respondents answered using a modified five-point Likert scale, where a = strongly agree and e = strongly disagree; these values were numerically coded on a scale of 5 to 1, respectively. The items marked with an asterisk were reverse coded in computing patient simulator satisfaction scores.

[b]The number preceding each item refers to its order in the patient simulator satisfaction report in Appendix F.

Okubo developed the form by surveying 55 (72% response rate) hospital and clinical teaching pharmacists at the University of Wisconsin Hospital and Clinics who regularly conducted medication-history interviews. The survey listed categories of information deemed important to medication-history interviewing based on a review of the literature; under each category were items eliciting more detail. For instance, under the main category entitled, "Side effects from past medications," 10 items were listed, including name of medication, dose or strength, description of side effect, outcome of treatment, length of time before side effect occurred, and route administered. The pharmacists were asked to indicate their value of each main category and content item on a modified seven-point Likert scale, with seven being the highest value.

The pharmacists' mean scores for each item served as the basis for determining content validity. Items having mean values of at least 6.0 were included in the first draft of the interviewing content evaluation form. Based on discussions with other investigators (including me), Okubo refined the instrument by adding items from the current prescription and nonprescription medications category that had mean values of at least 5.0 on the pharmacists' survey. She also added an item for each major category indicating whether the student asked a screening question (ASQ). Okubo reformatted the instrument so that it could handle up to five medications, and she developed a document that elaborated on the form's short item descriptions.

Table 11 lists the items included in the final version of Okubo's interviewing content evaluation form. The items were scored as 1

Table 11. Items in Interview Completeness Variable

Current prescription medications (ASQ)[a]
Name of medication
Dose or strength
Schedule (tid, qd, etc., or prn)
Actual versus prescribed use
Gathers data describing course of therapy
Reason for use
Effectiveness as stated by patient
Assesses side effects or adverse reactions or both
Current nonprescription medications (ASQ)
Name of medication
Dose or strength
Schedule (tid, qd, etc., or prn)
Assesses side effects or adverse reactions or both
Gathers data describing course of therapy
Past prescription and nonprescription medications (ASQ)
Name of medication
Why medication was stopped
Reason for use
Dose or strength
Schedule
Side effects from past medications (ASQ)
Name of medication
Dose or strength
Description of side effect
Allergies from past medications (ASQ)
Name of medication
Description of reaction
Determines if patient was rechallenged
Determines actions taken
Allergy to penicillin
Allergy to sulfa drugs
Allergy to iodine
Allergy to vaccines
Miscellaneous points
The interviewer determines whether the patient has any difficulty taking the drug (for example, difficulty remembering, missing doses)
The interviewer determines whether the patient has any concerns or problems with the drug(s)

[a]The abbreviation ASQ means asked screening question, which refers to a general question regarding the necessity of asking further questions in that category.

("yes" response or check mark) or 0 ("no" response or blank) for each relevant part of the medication history obtained (Appendix G). For instance, if the interviewer asked a screening question about current nonprescription drug use and subsequently obtained complete information about the two products the patient used (say, aspirin and a vitamin as in the medication history used in this study), the rater would check "yes" for asked screening question (ASQ) for that category and then would check all items in that category in column A for aspirin and column B for the vitamin. All information gathered was assumed to be correct.

The student's interview completeness score was tabulated as the total sum of points awarded on the form.

While Okubo's content evaluation form lists an item about the interviewer giving incorrect information, I eliminated that item from the completeness measure used in this study since my interest focused on the information gathered, not given.

Both the interviewing content evaluation form and the interviewing process evaluation form (described below) were completed by a panel of pharmacy raters who reviewed the videotaped interviews. Section D of this chapter describes this rating process, as well as the reliability checks of the instruments.

5. Interviewing Process Evaluation Form

Within the context of medication-history interviewing, interviewing process is defined as interview skill, which refers to the techniques used to gather clinically valid and reliable information.

From research on what constitutes quality interviewing and using the Arizona clinical interview rating (ACIR) scale as a guide (Stillman et al., 1977; Gardner and Burpeau-DiGregorio, 1985), I developed a 22-item interviewing process evaluation form (Appendix H) and its descriptive documentation (Appendix I). The evaluation form was built around the individual skills listed on pages 9-10. These documents were reviewed for face and content validity by a group of pharmacy practitioners, educators, and supervisors at the University of Wisconsin School of Pharmacy and Hospital and Clinics. The main category headings of this instrument are the opening, nonverbal behavior, verbal behavior, interviewing process techniques, rapport and relationship, and closure; the instrument also contains an overall section.

Each item on the form was scored using a modified five-point Likert scale with anchoring statements for each point (5 = excellent, 4 = very good, 3 = good, 2 = needs improvement, 1 = poor). To avoid acquiescent response set on the part of the rater and to anchor the behavioral determinants with statements more realistic to pharmacy practice, a number of individual items were coded such that if the student, for example, used a high amount of leading questions (a negative behavior), the rater marked a lower point on the scale. In other words, all positive behaviors were intended to receive the higher scores. A student's score on interview skill resulted from summing the choices made by the rater.

Two points deserve special attention at this juncture. First, of the 22 items on the interviewing process evaluation form, one is not

Table 12. Items in Interview Skill Variable[a]

Opening
Introduction, names exchanged, role, purpose, r duration
*Asked for the patient's height and weight durin
Nonverbal behavior
Eye contact, facilitation, mannerisms
Verbal behavior
Open and closed questions
Leading or loaded questions
Double or multiple questions
Question repetition
Jargon and terminology
Vocal qualities
Interviewing process
Flexibility, logic, transitional phrases
Pacing and flow
Interruptions
Clarification and verification
Rapport and relationship
Presentation confidence
Reinforcing cooperation
Responses to patient problems and concerns
General attitude
Closure
Summarization
Feedback, further questions, and good-byes

[a]Raters used a modified five-point Likert scale, w and 5 = excellent, except that the item marked with an dichotomous variable coded as 0 = yes, 1 = no.

Table 12. Items in Interview Skill Variable[a]

Opening
Introduction, names exchanged, role, purpose, reason for visit, duration
*Asked for the patient's height and weight during opening
Nonverbal behavior
Eye contact, facilitation, mannerisms
Verbal behavior
Open and closed questions
Leading or loaded questions
Double or multiple questions
Question repetition
Jargon and terminology
Vocal qualities
Interviewing process
Flexibility, logic, transitional phrases
Pacing and flow
Interruptions
Clarification and verification
Rapport and relationship
Presentation confidence
Reinforcing cooperation
Responses to patient problems and concerns
General attitude
Closure
Summarization
Feedback, further questions, and good-byes

[a]Raters used a modified five-point Likert scale, where 1 = poor and 5 = excellent, except that the item marked with an asterisk was a dichotomous variable coded as 0 = yes, 1 = no.

D. Use of Rater Panel for Completing Content and Process Forms

As described in the previous section, the behavioral variables of skill and completeness were defined from interviewing process and content conceptualizations. The objective evaluation instruments for content and process were reviewed and refined by my pharmacy and behavioral studies research panel. A rater panel used these instruments when evaluating the videotaped interviews. The rating was done in two waves. The first wave represented a reliability test of the instruments. Once reliability was assured, then all remaining interviews were evaluated.

The panel involved in the reliability test of the process and content instruments consisted of two clinical pharmacy practice faculty members and one pharmacist-trained doctoral (Ph.D.) candidate from the University of Wisconsin School of Pharmacy and three pharmacist clinical instructors from the University of Wisconsin Hospital and Clinics. All the raters were volunteers, five were men, and their ages ranged from 30 to 40 years.

I conducted two training sessions, each lasting 90 minutes, with the rating panel. Before the first session, the panelists received the process and content evaluation forms, along with documents elaborating on the abbreviated item descriptions on the forms. They also received procedural instructions on completion of the forms, a copy of the simulated patient's medication history, and a short description of the research purpose. The raters were asked to become acquainted with these documents. During the training sessions, the raters scored four

videotaped student interviews.[7] After each interview, we discussed it and any discrepancies among the raters' scores. These discussions led to refinements in the descriptive documents that helped clarify interpretations and scoring procedures.

To test the interrater reliability of the content and process forms, two videocassettes containing 12 interviews in all were then circulated among the six panel members. Interrater reliability tests the extent to which multiple observers using the same evaluation instrument, when observing the same interview and interviewer, obtain the same score. Raters reviewed the interviews individually and refrained from discussing scores or interviews with other raters. To prevent fatigue, the raters observed no more than three interviews in one sitting.

Interrater reliability on the final versions of the process and content instruments were assessed using standardized Cronbach's alpha coefficients since the resultant total scores on each were normally distributed. Cronbach's alpha for the process evaluation instrument was 0.9157, and alpha for the content form was 0.939.

Since the reliability coefficients exhibited sufficient interrater reliability, the remaining 100 interviews were randomly divided among five of the six panel members for scoring.[8]

The results from the 12 interviews used for the reliability sam-

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[7]These interviews were not part of the subsequent reliability assessment but were from the sample of 112.

[8]Because of other time commitments, one man from the original panel did not evaluate any of the remaining interviews.

strengths of relationships are calculated from a regression analysis that produces numbers analogous to the partial relationships in the elaboration model. These path coefficients, as they are called, represent the strengths of the relationships between pairs of variables with the effects of all other variables in the model held constant. Standardized regression coefficients (Beta) are the numbers used in path analysis. Standardized coefficients are expressed in the standard deviation units and are comparable within a single regression equation. Raw regression coefficients, on the other hand, are in units that depend upon the type of measure underlying each variable.

Although path analysis is an excellent way of handling complex causal chains and networks or variables, path analysis does not tell the causal order of variables. Nor is the path diagram generated by computer. Rather, the investigator decides the structure of relationships among the variables and uses computer analysis merely to calculate the respective path coefficients.

The models of factors affecting medication-history interviewing behavior tested in this study are shown in Figure 1 (p. 57). In developing these models, I made the following causal-order assumptions: Student background variables of gender and father's education may affect precursory variables of people and health-care orientation, communication apprehension, and prepharmacy gradepoint average. These, in turn, may affect interview orientation, which, in turn, may affect interview skill and ultimately interview completeness and patient simulator satisfaction. Simulated patient gender is included as a background variable.

I first tested two unrestricted models, one with interview completeness as the dependent variable and the other with patient satisfaction as the dependent variable. These unrestricted analyses allowed each variable in the models to be explained by variables temporally preceding it (i.e., by variables in columns to its left in Figure 1). With one exception, no linear recursive effects were eliminated on a priori grounds. Based on theoretical considerations, the background characteristic of simulated patient gender was only specified to be a determinant of interview skill, interview completeness, and patient simulator satisfaction.

The next step in testing the models involved restricting the two unrestricted models by eliminating from the equations any variable whose Beta coefficient had a p value >0.10. This cut-off was chosen as a method of "theory trimming" (Pedhazur, 1982) in which significance is evaluated in conjunction with meaningfulness of the model's path coefficients. The 0.10 level is liberal enough to allow for the inclusion of useful determinants while excluding the less meaningful ones. As in the unrestricted models, no linear recursive effects were eliminated on a priori grounds except for those of simulated patient gender. Paths whose regression coefficients had a p value ≤ 0.05 were considered significant.

In addition to testing all linear effects in the restricted models, I allowed for the possibility of an interactive effect of student gender and patient simulator gender on the behavioral outcomes

of interview skill, completeness, and patient satisfaction.[9] While no interaction effect existed, simulated patient gender was still included temporally in the model for its independent association with the behavioral outcomes.

Data were analyzed by computer using SPSS^X (1983). Missing data were coded as 9 and excluded from analysis.[10] Pairwise deletion was used in the correlation analysis and multiple regression analyses when a data point was missing for either variable on one case.

F. Limitations of Methods

The design of this study, which did not use a control group, was constructed to comply with my untestable instructional goals, testable experimental goals, and the realities of medication-history interview-

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[9]Computed as the product of student gender and simulated patient gender, the interaction variable had a value of one for female dyads and a value of zero for mixed and male dyads. Since conceptually it was decided that the gender interaction variable could only influence interview skill and the dependent variables of interview completeness and patient satisfaction, these restricted models were tested. (The gender interaction variables temporally followed student and simulated patient gender and preceded skill.) The interaction variable had no significant direct effect on the interviewing behavioral outcomes in either model.

[10]It should be noted that this method of handling missing data has the potential for limiting the representativeness of the sample. An alternative method of handling missing data is to replace missing data with mean values of the variables. This approach, however, decreases the variability of the sample, which may mask relationships among variables in multivariate analyses. While both methods are acceptable, I opted for the less conservative approach because I believed the variability of the sample given the missing cases would be a better representation of the sample population than a "homogenized" sample. Another factor in my decision was the fact that I had no missing cases for five variables (including the three interviewing outcome measures) and fewer than 10 missing cases for two other variables.

ing in an ambulatory clinic setting. I believe such a balance between internal and external validity is important for any experiment designed to understand and evaluate a clinical, social, and professional practice phenomenon. Studies and experiments on different strategies, techniques, and factors affecting interviewing behavior may appear totally contradictory if the investigator does not take the social context of the interview into consideration. The contextual model is not only useful as a sensitizing framework in planning interviewing studies; it is also useful for determining the applicability of experiments of interviewing methods to a particular situation. All too frequently, investigators select a method proven successful in one setting only to be disappointed by its failure in another. There is also a danger that the reverse occurs. A particular approach, potentially effective in one situation, is rejected because future studies show its inadequacy in quite different circumstances. Both of these unfortunate limitations can be reduced by applying the contextual framework when comparing results of different studies of interviewing methods.

While I believe the design of this study is adequate for meeting the research objectives, several limitations should be kept in mind when reviewing the results.

First, since the sample consists of students from one course from one school of pharmacy, the findings are suggestive rather than generalizable.

Second, every effort was made to make the outcome variables of interview skill, interview completeness, and patient satisfaction good

measures, both by face validity assessments and reliability measurements. However, since this study is the first to use these measures, more research is necessary to establish fully their potential usefulness. Perceived problems and suggestions for future variable construction from a retrospective point of view will be discussed in Chapter 4.

Similarly, the potential usefulness of the question relating to reason for choosing pharmacy as a major and the resulting dichotomization of professional orientation used in this study should be investigated further.

Third, it was not possible to include all variables having explanatory promise in the models. However, the models were specified based on theoretical, empirical, substantive, and experiential findings from social sciences, pharmacy, and pharmacy practice. The advantage of this approach is its interpretive and exploratory soundness when choosing among correlated variables and when evaluating the results.

Fourth, self-reported prepharmacy gradepoint average may be an inflated measure of actual gradepoint averages; this is not a serious flaw if respondents uniformly inflated their gradepoint averages.

Fifth, as mentioned in the data analysis section, it is the investigator who decides the structure (i.e., causal order) of relationships among variables when using path analysis. This is an obvious limitation of path analysis, and it is one that researchers attempt to control by induction, as well as by deduction. Also, while pairwise deletion is an acceptable method of treating missing data,

the possibility that the method may limit the representativeness of the sample should be kept in mind.

Finally, as mentioned in the literature review, the use of simulated patients poses some limitations. I believe the advantages of using simulators outweigh the disadvantages of using actual patients, however. By hiring actors as patients and using a panel of raters, I avoided using the simulated patients as teachers and evaluators.

Despite these limitations, I believe the proposed analysis is valuable and will shed light on a previously unexamined research question. The data lay the groundwork for more extensive research in the future, and analysis should proceed keeping the caveats in mind to protect against overinterpretation of the findings.

It should be remembered that the objective of the project was to study factors affecting the interviewing behavior and outcomes of pharmacy students, not to study the effect of the educational program. As such, the study design does not include an evaluation of the communication-interviewing module presented to the student subjects or an evaluation of the training session for the panel of raters. Plus, I have no evaluation of the cognitive processes the students or raters used in defining the interviewing task at hand. There were no control groups to evaluate the effect, if any, of the teaching module, advance information about the patient, or the simulator method on the students' interviewing behavior. Likewise, there was no evaluation of the educational value of the individual feedback sessions held later.

CHAPTER 3

RESULTS

A. Univariate Distributions and Descriptive Statistics

All 112 students in the "Social Studies of American Pharmacy" course took part in the medication-history interview. Of these, 107 (95.5%) voluntarily completed the in-class communication apprehension survey. Ninety-five students (84.8%) signed the informed consent agreement and completed the attitude survey before their scheduled interviews. Therefore, the maximum number of cases for variables derived from these two sources were 107 and 95, respectively.[1]

Tables 13 and 14 show the univariate distributions and descriptive statistics for all 10 study variables.

Of the 112 students, 59 were men and 53 were women. The students were split fairly evenly between the two patient simulators. The male simulated patient interviewed with 57 students, the female simulated patient with 55 students. A two-by-two crosstabulation calculated to check for balanced gender dyads of student and simulated patient (same-sex and opposite-sex dyads) was not significant ($X^2 = 0.032$, $p = 0.8578$, n.s.). In other words, there was no significant difference in occurrence among the four dyad possibilities.

As previously described, father's education was used as the measure of parents' education in the model instead of mother's education.

Of the 94 valid responses for father's education level, 10

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[1]See Table 7 in Chapter 2 for a summary of the sources of data for variable construction.

Table 13. Descriptive Statistics for Categorical Variables in the Models[a]

Variables and Categories	Frequency No.	%	Mean ± S.D.
Student gender[b]			
Male	59	52.7	
Female	53	47.3	
Missing	0		
Valid cases	112	100.0	0.473 ± 0.502
Father's education[c]			
Less than high school	10	10.6	
Graduated from high school	24	25.5	
Completed 1 to 3 years of college or technical school	18	19.1	
Graduated from college (B.A. or B.S.)	24	25.5	
Had some postgraduate training	18	19.1	
Missing or don't know	18		
Valid cases	94	100.0	3.170 ± 1.300
Reason for choosing pharmacy as a major[d]			
People and health-care orientation	48	45.3	
All others	58	54.7	
Missing	6		
Valid cases	106	100.0	0.453 ± 0.500
Patient simulator gender[e]			
Male	57	50.9	
Female	55	49.1	
Missing	0		
Valid cases	112	100.0	0.491 ± 0.502

[a]If there was a missing value for a variable, the case was excluded from analysis.

[b]Coded as male = 0, female = 1.

[c]Coded as listed from 1 to 5.

[d]Responses for people and health-care orientation coded as 1, all others as 0.

[e]Coded as male = 0, female = 1.

Table 14. Descriptive Statistics for Continuous Variables in the Models[a]

Variable	No. Valid Cases	Mean ± S.D.	Range
Communication apprehension	107	67.486 ± 16.562	34-109
Prepharmacy gradepoint average	92	3.114 ± 0.442	2.2-4.0
Interviewing orientation	95	53.179 ± 4.482	45-65
Interview skill	112	65.214 ± 11.768	28-86
Interview completeness	112	15.348 ± 3.683	7-23
Patient-simulator satisfaction	112	44.268 ± 6.694	25-60

[a]If there was a missing value for a variable, the case was excluded from analysis.

students (10.6%) reported that their fathers did not complete high school, while 24 (25.5%) noted that their fathers graduated from high school. Eighteen students (19.1%) marked that their fathers completed one to three years of college or technical school. Close to 45% of the respondents' fathers graduated from college, and 42.9% of these had some postgraduate training.

Overall, the mean[2] level of the students' indication of their father's educational attainment on this ordinally constructed variable was 3.170 ± 1.300, ranging from 1 representing less than high school education to 5 representing some postgraduate training.[3] Therefore, on the average, the students' fathers completed one to three years of college or technical school.

The item requesting students to indicate their reason for choosing pharmacy as a major had 106 usable responses. Of these, 48 (45.3%) chose pharmacy as a major because they liked working with people and wanted to be in a health profession. Fifty eight (54.7%) chose pharmacy for either the chemistry, the challenge, potential job

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[2]All mean values are reported as mean ± S.D.

[3]Father's education was recoded into the ordinal representation presented here. The original variable had two categories representing "less than high school graduate." The categories "8th grade or less" and "9th, 10th, or 11th grade" had frequency counts of 7 and 3, respectively.

opportunities, or another undetermined reason.[4]

Possible scores on the measure of communication apprehension can range from 24 to 120. For the 107 students completing the communication apprehension survey, the scores ranged from 34 to 109. The mean communication apprehension score was 67.486 ± 16.562, which is slightly higher (i.e., slightly more apprehensive) than results for both the general population and a national sample of pharmacy students (Berger, Baldwin, McCroskey, and Richmond, 1983).[5]

Of the 95 students completing the attitude survey, 92 students reported their prepharmacy gradepoint average. The mean prepharmacy gradepoint average was 3.114 ± 0.442, ranging from a low of 2.200 to 4.000. With a possible range of 4.000 being equal to the letter grade "A" and 0.000 being equal to a letter grade "F," the students have a mean value slightly over 3.000 or "B."

Pharmacy student scores on the 13-item interviewing orientation scale were distributed normally and ranged from 45 to 65 (mean = 53.179 ± 4.482). It is difficult to assess whether the score distribution represented a generally negative or positive interviewing

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[4]Reason for choosing pharmacy as a major was presented to the students with four choices. I chose to represent the dichotomy for testing a people and health-care orientation with all other choices. The original frequency counts for this variable were as follows: 17 students thought there would be good job opportunities, 48 liked working with people and wanted to be in a health profession, 29 liked subjects such as chemistry and thought pharmacy would be challenging, and 12 indicated "other." Data were missing for this variable for six students.

[5]The mean ± S.D. communication apprehension score for the general population was 65.6 ± 14.1 ($n \geq 40{,}000$); for a national sample of pharmacy students, the mean score was 65.15 ± 16.28 ($n = 9{,}830$) (Berger, Baldwin, McCroskey, and Richmond, 1983, p. 97).

orientation because the modified Likert scaling distributes the subjects along a continuum, but without reference to an absolute neutral point. However, if we assume that the middle response (3 = uncertain) for each scale item reflected neither positive or negative orientation, then a total score of 39 represents the neutral point. On this basis, I suggest that most of the student interviewers in this study had a positive orientation toward interviewing.

Similarly, responses to the 12-item patient satisfaction scale were distributed normally and ranged from 25 to 60 (mean = 44.268 $\pm$ 6.694). If we apply the same assumption to this scale (i.e., uncertainty represents neutrality), then a total score of 36 represented the patient simulator's neutral point. On this basis, the two patient simulators, I suggest, were satisfied with the 112 student interviewers.

All 112 students were evaluated by the raters in terms of interview skill and completeness exhibited in gathering medication-history data. The interviewing process and content evaluation forms produced total scores that were normally distributed.

Pharmacy student scores on the interviewing process evaluation form ranged from 28 to 86, with a mean score of 65.214 $\pm$ 11.768. As with previous measures, the modified Likert scale for this variable distributes the subjects along a continuum but without reference to an absolute neutral point. For this variable, I assume that the middle response (3 = good) for each of the 19 items reflected an "average" skill accomplishment. Therefore, a total score of 55 represents this average, good, or neutral point. On this basis, the students were

judged by the raters to demonstrate higher than average levels of interview skill.

The interview completeness scores ranged from 7 to 23, with a mean score of 15.348 ± 3.683. The total scores were distributed normally. Okubo's interviewing content evaluation form was designed to be flexible so that it could be used with different patient histories. As such, there is no "total" score against which to compare the percentage accuracy or percentage completeness of information gathered. In the interest of investigative thoroughness, though, I figure that a total score of approximately 30 was the maximum possible score obtainable from the simulated patient's medication history in this study (Appendix J). Using this as a guide, the students on the average obtained about half of the available information from the patient.

While only the students' total interview skill and completeness scores were used in data analysis, interested readers will find the subscores for these measures in Appendix K.

B. Zero-Order Correlations among Variables

The bivariate correlations among the variables in the models are shown in Table 15.[6] A number of zero-order correlations stand out.[7]

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[6]The correlation matrix also shows the number of cases for each variable pair, which illustrates the attrition of cases due to pairwise deletion.

[7]It should be kept in mind that while correlation coefficients are useful as preliminary analyses of relationships between variables, they are open to spurious and uncontrolled factors. Also, correlation coefficients are symmetrical measures that do not account for direction of effects. For these reasons, it is important to also conduct other controlled analyses, like multiple regression analysis.

Table 15. Zero-Order Correlations for Study Variables

Variable	Correlation Coefficient (No. of Valid Cases) 1	2	3	4	5	6	7	8	9	10
1. Student gender	1.000									
2. Patient simulator gender	.035 (112)	1.000								
3. Father's education	-.055 (94)	-.072 (94)	1.000							
4. People and health-care orientation	.355 (106)	.110 (106)	-.092 (89)	1.000						
5. Communication apprehension	.157 (107)	-.079 (107)	-.175 (90)	-.162 (105)	1.000					
6. Prepharmacy gradepoint average	.174 (92)	.080 (92)	.134 (91)	-.030 (87)	-.137 (88)	1.000				
7. Interviewing orientation	.205 (95)	.081 (95)	.058 (94)	.320 (90)	-.339 (91)	.262 (92)	1.000			
8. Interview skill	.201 (112)	.060 (112)	-.020 (94)	.014 (106)	.028 (107)	.378 (92)	.291 (95)	1.000		
9. Interview completeness	.237 (112)	.228 (112)	-.024 (94)	-.102 (106)	.068 (107)	.208 (92)	.144 (95)	.444 (112)	1.000	
10. Patient simulator satisfaction	.370 (112)	.111 (112)	-.027 (94)	.271 (106)	-.074 (107)	.436 (92)	.335 (95)	.450 (112)	.227 (112)	1.000
Mean	.473	.491	3.170	.453	67.486	3.114	53.179	65.214	15.348	44.268
Standard deviation	.502	.502	1.300	.500	16.562	.442	4.482	11.768	3.683	6.694

The gender of the pharmacy student is moderately correlated with the student's reason for choosing pharmacy (r = 0.355). Women reported that they chose pharmacy because of its people and health-care orientation more than their male counterparts. Also, there was a strong relationship between student gender and patient simulator satisfaction. Female pharmacy students tended to receive more positive scores in patient simulator satisfaction (r = 0.370). Student gender was also positively correlated (r > 0.2) with interviewing orientation, interview skill, and interview completeness.

The gender of the patient simulator had only one zero-order correlation over 0.2. Students who interviewed the female simulated patient tended to have higher interview completeness scores (r = 0.228).

Having a people and health-care orientation toward choosing pharmacy as a major is strongly related in a positive direction to the student's interviewing orientation and the patient simulator's measure of satisfaction (r = 0.320 and 0.271, respectively).

The strongest relationship of communication apprehension with another variable is in the negative direction. Students reporting higher levels of communication apprehension tend to have a negative orientation toward interviewing (r = -0.339).

The variable with the strongest overall zero-order correlations is prepharmacy gradepoint average, and these relationships are with the variables temporally placed to its right in either model. Students who reported higher prepharmacy gradepoint averages than their colleagues received higher scores from the patient simulator on

satisfaction (r = 0.436) and from the raters on interview skill (r = 0.378). Prepharmacy gradepoint average is also positively correlated (r > 0.2) with interviewing orientation and interview completeness (r = 0.262 and 0.208, respectively).[8]

Interviewing orientation has two strong relationships with variables not previously mentioned. Interview skill and patient simulator satisfaction exhibit positive correlations with interviewing orientation (r = 0.291 and 0.335, respectively).

A strong positive relationship exists between interview skill and the dependent variables of interview completeness (r = 0.444) and patient simulator satisfaction (r = 0.450). The dependent variables of interview completeness and patient simulator satisfaction exhibit a correlation coefficient of 0.227.[9]

C. Multivariate Analyses

The models of patient simulator satisfaction and interview completeness were tested using multiple regression analysis as described in Chapter 2. Table 16 shows the results of the unrestricted analysis

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[8]Both models have three endogenous variables entered simultaneously on both theoretical and temporal grounds. These variables are prepharmacy gradepoint average, communication apprehension, and people and health-care orientation. Multicollinearity could be a problem in this case, but I dismissed this methodologic concern based on the low zero-order correlations of these variables (Table 15) and examination of the correlations of their residuals. The three exogenous variables of father's education, student's gender, and simulated patient's gender also exhibit small zero-order correlations, thereby decreasing or eliminating the problem of multicollinearity between those variables.

[9]Although this is not a strong correlation, it further contributed to the decision to use two models, each with one dependent variable.

Table 16. Unrestricted Regression Equations for Path Models

Dependent Variables Regressed on Listed Independent Variables	Regression Coefficients[a] b	Se b	Beta
Patient simulator satisfaction			
Interview skill	.159**	.057	.279
Interviewing orientation	.117	.157	.078
People and health-care orientation	2.316†	1.363	.173
Communication apprehension	-.009	.041	-.022
Prepharmacy gradepoint average	4.265**	1.507	.282
Father's education	-.199	.468	-.039
Student gender	2.498†	1.348	.187
Patient simulator gender	.468	1.189	.035
Constant	13.369		
Adjusted R^2	.336		
Interview completeness			
Interview skill	.118***	.033	.377
Interviewing orientation	.043	.093	.052
People and health-care orientation	-1.656*	.808	-.225
Communication apprehension	.004	.024	.019
Prepharmacy gradepoint average	-.053	.893	-.006
Father's education	-.024	.278	-.008
Student gender	1.618*	.799	.220
Patient simulator gender	1.614*	.705	.220
Constant	4.570		
Adjusted R^2	.229		
Interview skill			
Interviewing orientation	.673*	.303	.256
People and health-care orientation	-1.937	2.705	-.082
Communication apprehension	.086	.080	.121
Prepharmacy gradepoint average	8.308**	2.852	.312
Father's education	-.501	.931	-.055
Student gender	2.354	2.671	.100
Patient simulator gender	.596	2.367	.025
Constant	-.686		
Adjusted R^2	.148		

†$p < .10$ *$p < .05$ **$p < .01$ ***$p < .001$

Table 16 (continued)

Dependent Variables Regressed on Listed Independent Variables	Regression Coefficients[a] b	Se b	Beta
Interviewing orientation			
People and health-care orientation	2.075*	.962	.232
Communication apprehension	-.079**	.028	-.293
Prepharmacy gradepoint average	2.074*	1.017	.205
Father's education	.027	.340	.008
Student gender	1.197	.971	.134
Constant	50.454		
Adjusted R^2	.209		
Prepharmacy gradepoint average			
Father's education	.049	.035	.144
Student gender	.160†	.092	.182
Constant	2.834		
Adjusted R^2	.029		
Communication apprehension			
Father's education	-2.131	1.331	-.167
Student gender	4.878	3.451	.148
Constant	74.064		
Adjusted R^2	.031		
People and health-care orientation			
Father's education	-.028	.039	-.073
Student gender	.350***	.100	.351
Constant	.404		
Adjusted R^2	.111		

†$p < .10$ *$p < .05$ **$p < .01$ ***$p < .001$

[a]Where b is the unstandardized regression coefficient, SE b is the standard error of b, and Beta is the standardized regression coefficient.

of the two models. By listing all equations run in the analysis, the table clearly illustrates how the models were constructed; that is, it shows each dependent variable regressed on the temporally preceding independent variables. It should be noted, however, that the last three equations having no or just one significant independent variable do not provide much meaningful information beyond what can be derived from the zero-order correlations.

The results of the subsequent restricted analysis for the two models are shown in Table 17. As described in Chapter 2, the models were restricted by eliminating from the unrestricted equations any variables whose standardized coefficient (Beta) had a p value > 0.10. As before, all equations run in the restricted analysis are listed in Table 17, even though the Beta coefficients of the significant variable in the last two equations are the same as the respective correlation coefficients.

Before examining the models further, it was important to evaluate the appropriateness of the models by plotting the residuals. A residual is what is left after a model is fit; that is, a residual is the difference between an observed value and the value predicted by the model. In this study, a standardized residual, defined as the residual for case i divided by the sample standard deviation, was used for analysis. Standardized residuals have a mean of zero and a standard deviation of one.

Examining the causal model's residuals using a casewise plot of residual outliers yielded two outliers with residuals greater than three in absolute value. The two outliers, each representing a

Table 17. Restricted Regression Equations for Path Models[a]

Dependent Variables Regressed on Listed Independent Variables	Regression Coefficients[a] b	Se b	Beta
Patient simulator satisfaction			
Interview skill	.170**	.054	.298
People and health-care orientation	2.819*	1.243	.211
Prepharmacy gradepoint average	4.501**	1.424	.297
Student gender	2.446	1.272	.183
Constant	16.753		
Adjusted R^2	.359		
Interview completeness			
Interview skill	.122***	.027	.389
People and health-care orientation	-1.568*	.662	-.213
Student gender	1.664*	.670	.227
Patient simulator gender	1.617**	.616	.221
Constant	6.544		
Adjusted R^2	.271		
Interview skill			
Interviewing orientation	.540*	.261	.206
Prepharmacy gradepoint average	8.607**	2.643	.324
Constant	9.702		
Adjusted R^2	.163		
Interviewing orientation			
People and health-care orientation	2.550**	.870	.285
Prepharmacy gradepoint average	2.381*	.979	.235
Communication apprehension	-.071**	.026	-.261
Constant	49.368		
Adjusted R^2	.214		

*$p < .05$ **$p < .01$ ***$p < .001$

Table 17 (continued)

Dependent Variables Regressed on Listed Independent Variables	Regression Coefficients[a] b	Se b	Beta
Prepharmacy gradepoint average			
Student gender	.153	.092	.174
Constant	3.042		
Adjusted R^2	.019		
People and health-care orientation			
Student gender	.354***	.091	.355
Constant	.285		
Adjusted R^2	.118		

*$p < .05$ **$p < .01$ ***$p < .001$

[a]Model was restricted by eliminating from the unrestricted equations any variable whose standardized coefficient (Beta) had a level of significance (p) greater than 0.10.

[b]Where b is the unstandardized regression coefficient, Se b is the standard error of b, and Beta is the standardized regression coefficient.

different case, were +3.26 and -3.01 for the variables interviewing orientation and interview skill, respectively. According to Cohen and Cohen (1983), outliers are probably best left alone if they are few in number (less than 1% or 2% of n) and not very extreme. Based on this advice, the two outliers identified in this study remained in the analysis.

Figures 2 and 3 display the restricted models of patient simulator satisfaction and interview completeness, respectively; these were constructed from the data in Table 17.

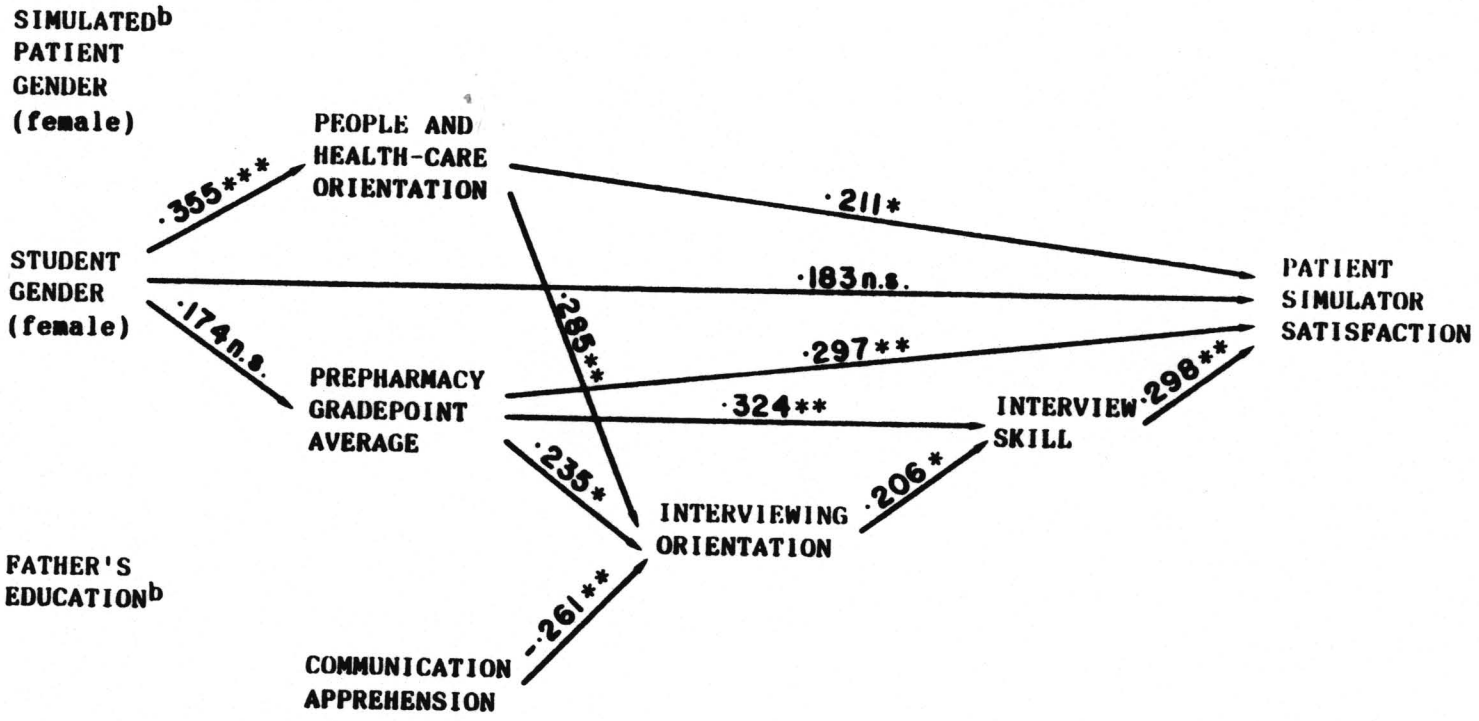
The determinant of self-reported academic ability as measured by prepharmacy gradepoint average and a people and health-care orientation is the same; both are functions of the pharmacy student's gender (Table 17). As a whole, women report higher gradepoint averages than men.

Choosing pharmacy as a major to work with people and be in a health-care profession is a function of the pharmacy student's gender. In this case, as with prepharmacy gradepoint average, the zero-order correlation represents the standardized regression coefficient. Females are significantly more oriented than males toward choosing pharmacy to work with people and be in a health profession.

The relationship of the exogenous variables of father's education and student gender with communication apprehension is nonexistent in the fitted model. In fact, father's education is not a determinant of any endogenous variables succeeding it in the fitted model.

For these pharmacy students, orientation toward medication-history interviewing is directly significantly affected by three

Figure 2: Restricted Model with Patient Simulator Satisfaction as a Dependent Variable[a]

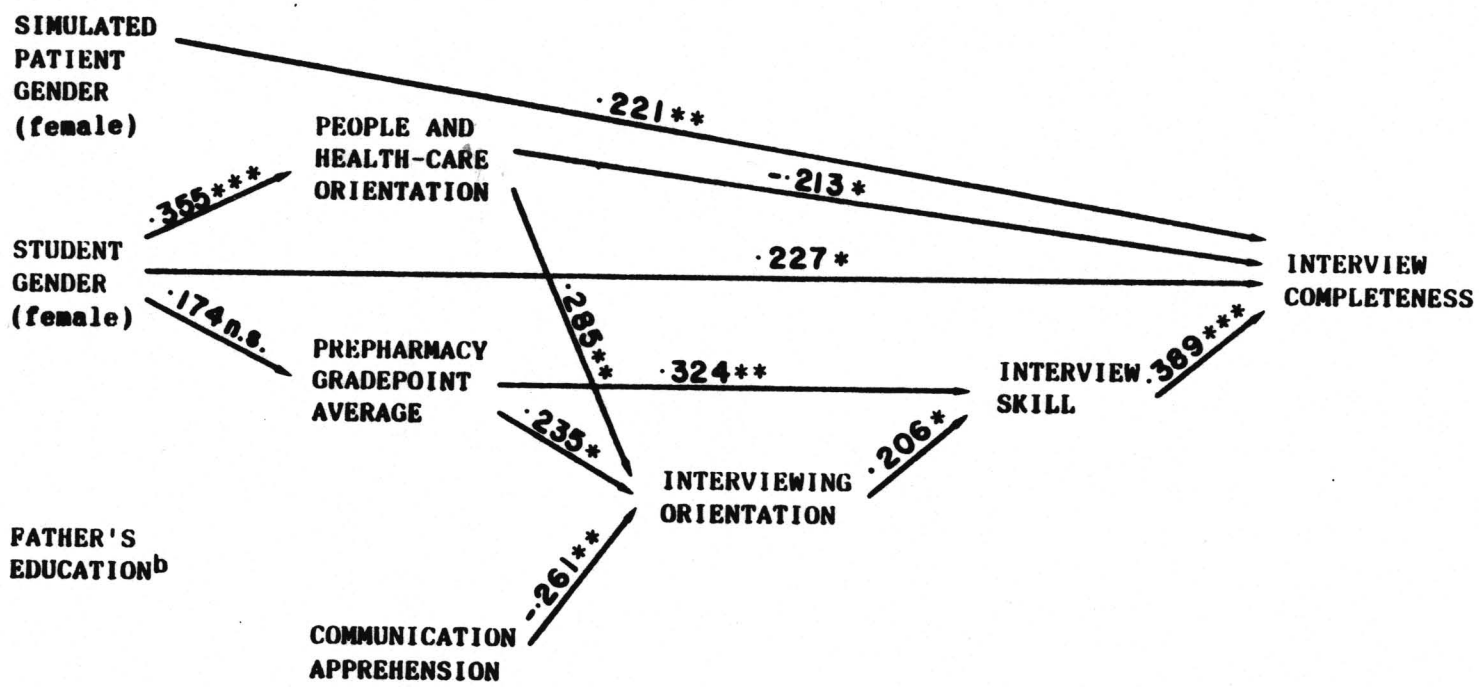


[a]Beta coefficients reported.

[b]These exogenous variables are not retained in the restricted model presented since the significance levels of their Beta coefficients were greater than 0.10 in the unrestricted model.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

Figure 3: Restricted Model with Interview Completeness as a Dependent Variable[a]



[a]Beta coefficients reported.

[b]This exogenous variable is not retained in the restricted model presented since the significance levels of its Beta coefficients were greater than 0.10 in the unrestricted model.

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

variables: people and health-care orientation, prepharmacy gradepoint average, and communication apprehension. Pharmacy students with a people and health-care orientation and students with a higher gradepoint average have significantly more positive attitudes toward medication-history interviewing. On the other hand, students with a higher level of communication apprehension have significantly less positive attitudes toward interviewing.

The two determinants of interview skill vary in their direct magnitude of influence, but are related significantly to skill. Student subjects with more positive attitudes toward interviewing score higher on interview skill. Students with higher gradepoint averages score similarly. The gender of the simulated patient has no direct influence upon interview skill in the fitted model.

The determinants of the two dependent variables of interview completeness and simulated patient satisfaction are much the same, except for the gender of the patient simulator and prepharmacy gradepoint average. Interview completeness is a function of interview skill, people and health-care orientation, and pharmacy student and patient simulator gender. Each of the four variables have a significant direct effect on interview completeness. Pharmacy students with higher scores on interview skill also have higher scores on interview completeness. Female students present higher completeness scores than males, and, surprisingly, a people and health-care orientation decreases the scores on interview completeness.

Patient simulator satisfaction with a medication-history interview is a direct function of the student's gender, interview skill,

people and health-care orientation, and gradepoint average. Interestingly, the interviewer's gender is positively but not significantly related to simulator satisfaction, while it is a significant direct determinant of interview completeness. A higher score associated with interviewing skill and a higher student gradepoint average lead to a higher satisfaction report from the patient simulator. Finally, a people and health-care orientation on the part of the student leads to higher satisfaction scores by the patient simulators. Communication apprehension and the gender of the patient simulator are not direct determinants of patient simulator satisfaction or interview completeness.

D. Comparison of Patient Simulator Satisfaction and Interview Completeness Models

Stepping back from the specific predictions and comparing the two models as a whole, a number of paths stand out (Figures 2 and 3).

Interview skill largely determines simulated patient satisfaction (Beta = 0.298) and interview completeness (Beta = 0.389). Prepharmacy gradepoint average and interviewing orientation significantly affect interview skill. These two predictor variables directly affect interview skill and, in turn, patient-simulator satisfaction and interview completeness. In addition, prepharmacy gradepoint average (Beta = 0.297, $p < 0.01$) and student gender (Beta = 0.183, n.s.) affect simulator satisfaction directly, whereas only student gender affects interview completeness directly. One other significant direct effect on patient simulator satisfaction is whether student subjects

have a people and health-care orientation in choosing pharmacy as a major area of study.

Women and students with a people and health-care orientation, a higher prepharmacy gradepoint average, and higher scores on interview skill receive higher satisfaction scores from patient simulators; student gender presents the only nonsignificant standardized coefficient of the four. Three of these same four direct determinants of patient satisfaction also directly significantly affect interview completeness. Women score higher on interview completeness than men, and interview skill has a large positive effect on interview completeness. Whereas a people and health-care orientation has a positive effect on patient simulator satisfaction, students with that orientation tend to have a negative effect on interview completeness.

Unlike the model of patient simulator satisfaction, prepharmacy gradepoint average has no significant direct effect on interview completeness. Significantly higher completeness scores are directly associated with the female patient simulator. No interaction effect of patient and student gender on interview skill, completeness, or patient simulator satisfaction exists.

In both models, people and health-care orientation, communication apprehension, and prepharmacy gradepoint average directly affect interview orientation. A higher gradepoint average, lower level of communication apprehension, and people and health-care orientation result in a significantly more positive interviewing orientation.

A student's gender directly affects prepharmacy gradepoint average and, in turn, interviewing orientation. In addition, people and

health-care orientation, communication apprehension, and gradepoint average affect interviewing orientation directly. Men tend to report lower gradepoint averages than women. The determinant of people and health-care orientation presents the clearest, significant direct relationship associated with an exogenous variable. Women pharmacy students overwhelmingly chose pharmacy as a major to work with people and be in a health profession ($\underline{r}$ = 0.355 and X^2 = 11.990, $\underline{p} < 0.001$).

Table 18 summarizes the direct, indirect, and total causal effects of the models' variables. It shows that a portion of the effect of precursory and specific background factors on the interviewing outcome variables of interview skill, interview completeness, and patient simulator satisfaction are indirect; that is, the effects of these variables are mediated by interviewing orientation and interview skill.

Student gender, people and health-care orientation, and prepharmacy gradepoint average present the most interesting results. The total effect of gender on patient simulator satisfaction is represented by a Beta coefficient of 0.335. The indirect negative effect of gender on interview completeness (-0.042) decreases the total effect of gender on completeness to 0.185.

Choosing pharmacy as a major for people and health-care profession reasons displays surprising results. The total effect on patient simulator satisfaction is 0.229, whereas the total effect on completeness is -0.190. A people and health-care orientation has only a small indirect effect on skill (0.059).

Prepharmacy gradepoint average has strong total causal effect

Table 18. Direct (D), Indirect (I), and Total (T) Causal Effects of Temporally-Ordered Variables in the Models[a,b]

Variable	Patient Satisfaction			Interview Completeness			Interview Skill			Interviewing Orientation			People and Health-Care Orientation			Communication Apprehension			Prepharmacy Gradepoint Average		
	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T	D	I	T
Student gender	.183	.152	.335	.227	-.042	.185	†	.086	.086	†	.142	.142	.355	†	.355	†	†	†	.174	†	.174
Father's education	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
Patient gender	†	†	†	.221	†	.221	†	†	†	na	na	na	na	na	na	na	na	na	na	na	na
People and health-care orientation	.211	.018	.229	-.213	.023	-.190	†	.059	.059	.285	†	.285	*	*	*	*	*	*	*	*	*
Communication apprehension	†	-.016	-.016	†	-.021	-.021	†	-.054	-.054	-.261	†	-.261	*	*	*	*	*	*	*	*	*
Prepharmacy grade-point average	.297	.111	.408	†	.145	.145	.324	.048	.372	.235	†	.235	*	*	*	*	*	*	*	*	*
Interviewing orientation	†	.061	.061	†	.080	.080	.206	†	.206	*	*	*	*	*	*	*	*	*	*	*	*
Interview skill	.298	†	.298	.389	†	.389	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

[a]Reported are standardized coefficients (Beta) from restricted models of interviewing behavior after eliminating from the unrestricted equations any variable whose standardized coefficient had a level of significance (p) greater than 0.10.

[b]The symbols used in this table are as follows: † means no effect; na means not applicable since there was no hypothesized path; and * means the Beta coefficient was not computable in the proposed model.

relationships with patient simulator satisfaction (0.408) and interview skill (0.372), but only an indirect effect on interview completeness (0.145).

To summarize these views of the two models, a number of paths stand out:

1. The strong positive direct and indirect effects of academic ability measured by self-reported prepharmacy gradepoint average;

2. The indirect effects of student gender on the endogenous variables;

3. The direct effect of patient simulator gender on interview completeness;

4. The strong, varied relationships influencing interviewing orientation;

5. The negative effect of a people and health-care orientation on interview completeness; and

6. The direct effects of interview skill on patient satisfaction and interview completeness.

CHAPTER 4

DISCUSSION

The central value of the interview as a research procedure is that it allows all parties to explore the meaning of the questions and answers that are involved. This central value can be extended beyond the interview encounter itself to the meaning of the questions and answers that these study results shed on the medication-history interviewing behavior of pharmacy students. This chapter presents the discussion of study results in three parts: descriptive findings; models; and adequacy of research design, measures, and models. Implications of the study and ideas for future research are presented in the next chapter.

As noted in Chapter 2, the results should be reviewed keeping the limitations of the study in mind.

A. Descriptive Findings

While Maguire and Rutter (1976) reported being disappointed with medical students' interviewing skills and abilities to detect patient problems, I believe the pharmacy students in this study performed quite well. Their mean scores on the three interviewing outcome variables of process, content, and patient satisfaction were either at or above the midpoint of the respective scales.

Pharmacy student scores for interviewing process ranged from 28 to 86, with a mean ($\pm$S.D.) score of 65.214 $\pm$ 11.768. The mid or average point for this scale rests at 55. Therefore, the rating panel

judged the students as showing process skills above the midpoint. Likewise, the students' interview completeness scores ranged from 7 to 23, with a mean score of 15.348 ± 3.683. With a score of 30 being the maximum score obtainable from the medication history used in this study, the mean score shows that the students obtained about half of the data points in the medication history.

The patient simulators were satisfied, on the whole, with the pharmacy student interviewers. The mean satisfaction score was 44.268 ± 6.694, which is above the scale's mid or average point of 36.

These process and content scores compare favorably with the pre-test scores of pharmacy students in the Arizona studies. In the first of those studies, students received ACIR-P process scores of 66.0% and obtained 58.2% of the 40 points on the content check list (Gardner and Burpeau-DiGregorio, 1985). The other study showed ACIR-P scores of 69.7% and 63.8% for students on the simple and complex medication histories, respectively (Gardner and McGhan, 1986). The respective content scores (maximum 40 points) were 42.8% and 44.4%.

How did these pharmacy students compare with a national sample of pharmacy students on the personal report of communication apprehension? The pharmacy students in my sample are slightly more apprehensive on the average than their national counterparts, with mean scores of 67.486 ± 16.562 and 65.15 ± 16.28, respectively. Interestingly, the pharmacy students in my study are slightly more apprehensive than pharmacy students nationally, yet they display above the average process skills, collect at least half of the potential content points, and are above the midpoint at satisfying the patient simulator. These

same students are also overwhelmingly positive with their attitudes toward interviewing (mean = 53.179 ± 4.482) even though their overall mean on communication apprehension leaves the impression that they are slightly more apprehensive than pharmacy students in general. This result lends credence to the interpretation by Berger and McCroskey (1982) that communication apprehension is related to skill but that it is not a measure of skill; however, Berger and McCroskey (1982) and Berger et al. (1983) do not specifically examine the relationship of communication apprehension to attitudes toward interviewing, a precursor in my models to interviewing process. The attitudinal link could be one reason why a high level of communication apprehension in some people may not obstruct them from performing well, as in the case of a medication-history interview.

B. Models

The results of this study suggest that the two models of medication-history interviewing represent behavioral outcomes at very different levels. One model reflects the level of competence as viewed by the patient in terms of satisfaction; the other model reflects the level of clinical competence as viewed by the clinician raters in terms of interview completeness. The results support the contention that interviewing process, content, and patient satisfaction are distinct yet related concepts within a medical interview setting, and, therefore, it cannot be assumed that they are influenced by the same determinants.

The most interesting results in the two models involve the

complex set of direct and indirect effects of gender, professional orientation, and interview skill on the dependent variables of patient satisfaction and interview completeness. In this study, women pharmacy students overwhelmingly chose pharmacy as a major for its professional orientation toward people and health care. This professional orientation, whether stated by men or women students, leads to a more positive orientation toward interviewing. The greater the interviewing orientation, the better the ratings received on process. In turn, the higher the process score, the more satisfied the patient simulator is in one model and the more content is gathered in the other model.

1. Professional Orientation

In examining the models more closely, let me first focus on the dynamics involving professional orientation. As noted above, a people and health-care orientation leads to a more positive orientation toward interviewing. It also directly leads to better patient satisfaction and lower completeness scores. It has no direct effect on interview skill.

The latter two findings seem surprising, since one would expect people and health-care oriented subjects to have better process skills, which would lead to better content. In effect, this is what Webb (1972, p. 104) means when he writes, "Interviewing is easy for the student who likes people." The model is not so simple, however.

One possible explanation for the negative relationship between professional orientation and content may be that people-oriented

subjects are "bound" by the content form used in this study. Like other content measures used in pharmacy studies, Okubo's evaluation form generally accounts only for drug information; it does not give points for gathering other pertinent information, such as lifestyles that contribute to poor compliance or dietary habits. It is possible that professionally oriented students may gather lifestyle data more readily than their counterparts, but these data are not reflected in the content scores. If this is the case, then the negative relationship between professional orientation and content is an artifact of the research method. This possibility should be investigated by repeating the study using a content form that encompasses all relevant information gathering.

It should be noted, however, that the gathering of lifestyle information would not be in lieu of gathering the specific drug-related points in Okubo's completeness measure. That is, people and health-care oriented subjects would still be expected to do better in gathering all types of information, even if the completeness measure did not capture their full potential. Therefore, while I see the need for refining the completeness measure (as described later in this chapter), I do not dismiss the negative relationship between professional orientation and completeness as an artifact of the study.

A more likely explanation for the negative effect of professional orientation on content may be that the interviewer concentrates too much on the pleasures of the social relationship instead of the substance of the interview, just as Henson, Cannell, and Lawson (1977) suggest. That is, people-oriented subjects may approach the interview

more as a conversation with a potential friend rather than as a conversation with a purpose. This results in a more personable style. They may use an unstructured approach to the interview, such that they do not use mental checks to ensure that they cover essential information. Also, if people-oriented subjects feel uncomfortable with a particular line of questioning or sense uneasiness in the simulated patients, they may try to change the subject rather than pursue follow-up questions to clarify necessary information.

As expected, better process does lead to better content in the model presented, but the effect is direct with no indirect assistance from a people and health-care orientation. The lack of direct effect of professional orientation on skill may mean that pharmacy students can learn to communicate effectively in professional situations, regardless of their specific interest in working with people.

Another explanation for the finding of no direct effect of people and health-care orientation on skill stems from the previous discussion of the effect of professional orientation on completeness. If people-oriented subjects indeed did exhibit communication behaviors directed more toward the social interaction than toward the professional interaction, then those communication behaviors were not interpreted by the clinician raters to be good interview skills. This explanation suggests that the measure of interview skill used in this study successfully tapped attributes of interviewing process and not just general communication skills.

Interestingly, the personable qualities of people-oriented subjects that may contribute to lower completeness scores also may

contribute to increased patient satisfaction. In this study, people and health-care orientation was positively related to patient simulator satisfaction. Studies by the Korsch group (Korsch et al., 1968; Freemon et al., 1971; Korsch and Negrete, 1972) and the assessments of Segall and Burnett (1980) and Inui and Carter (1985) support the hypothesis that a positive outcome of a provider-patient encounter is associated with specific communication styles, particularly styles that reduce status differences between the parties and incorporate the patient's perceptions into joint decisions or identification and management of the problem. Segall and Burnett (1980), for example, found that patients' general level of satisfaction was strongly correlated with perceived conformity to affective expectations. Similarly, in my study the patient simulators were more satisfied with student interviewers with a people and health-care orientation, who presumably are more personable than students with other professional orientations.

Patient satisfaction studies also show that patients desire physicians who display an "affective quality" as well as technical competence. But patients and providers may have different perceptions of what constitutes professional competence (Ben-Sira, 1976), and patients may have different perceptions of satisfaction depending upon the setting from which they receive care (Vuori et al., 1972). I believe the effect of people and health-care orientation on the dependent variables in my study illustrate these differences in perception. The patients were more satisfied with people-oriented interviewers who did not get as much information as other interviewers.

This latter finding illustrates that the two models of medica-

tion-history interviewing represent behavioral outcomes at very different levels: patient assessment of competence in terms satisfaction and clinician assessment of competence in terms of interview completeness.

In concluding this discussion of people and health-care orientation, let me point out that this variable exerts its effect on the outcome measures of interview completeness and patient satisfaction directly with little indirect effect. People and health-care orientation does have a strong positive effect on interviewing orientation. But, despite its positive effect on interview skill, interviewing orientation has just a small positive indirect effect on the outcomes of interview completeness and simulator patient satisfaction. The lack of indirect effects of people and health-care orientation is interesting. Why? While the direct relationship of people and health-care orientation and interviewing orientation shows that values underlying the professional orientation do influence attitudes about interviewing as Rokeach (1973) suggests, professional orientation's primary influence is directly on the outcomes with little indirect assistance from interviewing orientation.

2. Student Gender

Gender of the student interviewer is an important predictor variable in the models of factors affecting outcomes of medication-history interviewing by pharmacy students. The most obvious effect of gender is the finding that women students collected significantly more information than men. One cannot dismiss, however, the effect of

being female on simulator patient satisfaction simply because the direct path is not significant. In addition to its direct effect, being female indirectly influences satisfaction, leading to a combined effect with a Beta of 0.335, which is one of the largest values for combined direct and indirect effects in the models. Student gender only influences interview skill indirectly.

Before presenting possible explanations for the effects of student gender, let me first identify the probable paths of the variable's indirect effects. Because women overwhelmingly chose pharmacy as a major for its people and health-care orientation, it appears that the indirect effects of gender are mediated by professional orientation. Student gender exerts a positive indirect effect on interviewing orientation, but that probably comes through professional orientation rather than prepharmacy gradepoint average since gender is not a significant predictor of prepharmacy gradepoint average.

Oliver and Barnes (1983) posit that the influx of women and the changing image of pharmacy as an interpersonal, rather than merely technical, profession raise many questions and concerns. Their study showed that female pharmacists tend to value communication more than men, but that women are less secure in their own perceived ability to communicate. If you can equate Oliver and Barnes' "values" with my measure of orientation toward interviewing, my study showed no such gender relationship. Similarly equating "less secure" with communication apprehension, I found no gender relationship.

If gender differences in communication exist as some researchers have suggested, one would expect to see a direct relationship between

gender and interview skill. My models show no such relationship. Being female has only an indirect effect on skill. One explanation for this finding is simply that no difference in interviewing process exists between men and women pharmacy students. Research has shown no definitive effects of physician gender on the quality of physician-patient interactions either (Weisman and Teitelbaum, 1985). Also, attitudes about sex roles may have become more egalitarian among men as well as among women students as more women students enter pharmacy school, and these attitudes are reflected in their behaviors. As Weisman et al. (1980) submits, the behavior (in this case, interviewing process) of men and women professionals tends to converge to the prevailing norms of the profession they represent as the number of women in the profession increases.

It should be noted that the interviewing process evaluation form used in this study was predicated on the skills and abilities all interviewers should display. As such, the instrument and its documentation incorporated affective qualities to be a good interviewer. If traditional sex-role stereotypes depicting women as being more expressive and humane than men are true and if this influences interview skill, the interviewing measure should have picked up the difference. No difference was detected.

If, however, the gender difference lies in specific language patterns as some researchers suggest, the instrument would not pick it up. My study did not evaluate particular speech patterns per se because I was interested not in the individual words used but in the overall effect of process on the interviewing outcomes.

It is possible that the direct and indirect effects of gender on patient satisfaction may be attributable to patients' perception that women are more expressive or humane. As noted in the previous section, patient satisfaction studies show that patients desire physicians who communicate well and who display affection. If women display or are perceived to display these qualities, higher patient satisfaction will result. Also, since it is possible that these same qualities are likely displayed by students with a people and health-care orientation, this may explain the indirect effect of gender through the professional orientation factor. Secondary analysis of the data to determine whether the effects of professional orientation hold up for men only may shed some light on this interpretation.

According to my model, female students collect more information than male students. Interestingly, the indirect effect of gender through people and health-care orientation decreases the total effect of gender on completeness.

The reasons why female interviewers collect more information are unclear. Women may simply do a better job of interviewing than men. And, the direct effect of simulated patient gender indicates that the female simulated patient gives more information. Since my analysis shows that there was no interaction effect of student gender and simulated patient gender on interview completeness, one cannot say that female students collected more information just from the female simulator (who gave more information to begin with).

The results of my study relating to completeness parallel those of Higgins (1981). Higgins found that female interviewers elicited

more intimate communication from interviewees than male interviewers; there was no interaction effect of interviewer gender on the amount of information collected, meaning that female interviewers collected more information from both male and female interviewees. In a separate analysis, Higgins found that female interviewees disclosed more information and information of greater intimacy than the male interviewees; again, no interaction effect between interviewee and interviewer gender on the amount of information disclosed was found.

Further research is needed to identify the reasons why women interviewers and interviewees elicit and share more information, respectively. The results of my study suggest that gender of the participants is one but not the only determinant.

Osborn and Vicars (1976) warn of the possibility that laboratory settings, in which greater control is available, may yield gender differences even when such differences account for a very small proportion of observed variance; such differences may not be observable in real-life situations. It is conceivable that the results of my study, in which some variables show significant differences and others show mixed results, may be attributable to the fact that student subjects were examined within a quasi-experimental job assignment.

Molm (1985) found substantial support for structural theory in her examination of power use and gender. She suggests that women can use power as effectively as men when placed in structurally equivalent positions. My study, although it did not examine power relationships per se, included gender of the student as a factor explaining medication-history interviewing behavior of pharmacy students. The models

lend some support for structural theory in that female students performed as well as or better than male students when placed in the structurally similar circumstance of conducting a medication-history interview.

3. Interviewing Orientation, Communication Apprehension, and Prepharmacy Gradepoint Average

Waitzkin (1985) displayed in his study a weak, but positive relationship between attitudes and information transmittal. Mason (1979) found a positive relationship between community pharmacists' counseling (information-giving) behavior and their role orientation toward counseling. My results display a significantly positive relationship between orientation toward interviewing and one behavioral outcome--process. This relationship leads to an indirect effect on patient simulator satisfaction in one model, content in the other. Having the attitudinal variable of interviewing orientation directly affect process and not content displays how different these two concepts are in a medication-history interviewing situation.

Berger and McCroskey (1982) posit that communication apprehension represents a cognitive dimension and communication skills represent a behavioral dimension of the communication process, but that apprehension has a strong association with communication behavior. As McCroskey noted (1970, 1978), apprehension is particularly highly associated with amount of talk the individual is willing to produce and the likelihood of an individual withdrawing from or avoiding communication situations.

Looking at my two models of medication-history interviewing outcomes, communication apprehension is not directly related to any of the three interviewing outcome variables of process, content, and patient satisfaction. As expected, communication apprehension is significantly related in a negative direction to the students' orientation toward interviewing. The influence of communication apprehension upon the interviewing behavioral outcomes, therefore, is only indirect. Simulated patients were not able to ascertain "apprehensive" students, and neither were the clinical raters through student behaviors. So, the psychological trait measure of communication apprehension has an indirect relationship upon behavioral outcomes only through the attitudinal variable of interviewing orientation. The lack of association between communication apprehension and any form of interviewing behavior may be a function of the PRCA scale itself, a function of the importance of interviewing attitudes, or both. As mentioned previously, PRCA does not contain many items specifically related to interpersonal communication, and, therefore, as a general measure of communication apprehension PRCA may not have predictive power for such a specialized behavior as interviewing.

Prepharmacy gradepoint average displays significant direct associations in a positive direction with patient satisfaction, process, and orientation toward interviewing. Absent, though, is a direct effect of prepharmacy gradepoint average on interview completeness. This latter finding may be a function of the information that needs to be collected. In other words, it may be that performance in the basic science prepharmacy coursework is not specifically related to the

interviewing task, which may depend on pharmacy coursework and professional maturity.

An alternative explanation for no direct effect of prepharmacy gradepoint average on completeness may be found in work by Ware et al. (1971) showing that the students' cognitive understanding of medical interviewing principles and interviewing behavior ratings (as rated by medical clerkship supervisors) were significantly negatively related. Based on these results, the researchers posited that cognitive understanding "gets in the way" of clinical performance.

Ware et al. (1971) further suggested that this surprising finding may be partially attributable to discrepancies between what the students were taught about interviewing techniques and interviewing philosophy and what their clerkship supervisors' views were. In this same vein, Carroll et al. (1981) suggested that the different trends they observed among separate rater groups consisting of faculty, simulators, and student interviewers may be because faculty perceived desired interviewing skills differently than students and simulators. I recognized these differences in perceptions as potential problems when I designed my study, and that is why I chose to use a panel for rating process and content instead of all preceptors from the fifth-year inpatient pharmacy clerkship course. All panel members attended two 90-minute training sessions, and the process and content evaluation measures were shown to be reliable. Similarly, that is why I chose to have the patient simulators rate only their satisfaction with the interview and not process and content, as well.

How does prepharmacy gradepoint average influence increased interview skill scores and increased patient satisfaction? One possibility is that the measure of academic ability serves as a surrogate to socioeconomic status. In stating this possibility, I am assuming that father's education, which was used as a background variable in this study and was not predictive of any factors, is not a good indicator of socioeconomic status; better predictors to use in future research are father's occupation, mother's occupation, or family income. Higher gradepoint average may indicate a higher verbal skill, which has been associated with higher socioeconomic status. The higher verbal skill may then be reflected in the higher satisfaction ratings and the higher skill scores.

Alternatively, students with higher grades may have studied the interviewing primer more than other students and hence had better interview skills. Also, if the simulators perceive which interviewers are "smarter," they may have more faith in them, resulting in higher satisfaction scores.

So, academic ability presents mixed results as a direct predictor of the three interviewing outcomes used in this study, as it has in studies of interviewing behaviors of medical students (Ware et al., 1971; Barbee and Feldman, 1970). I find it difficult to dismiss academic ability as a determinant of student performance in interviewing activities, despite the lack of direct effect on interviewing content.

C. Adequacy of Research Design, Measures, and Models

1. Research Design

In this section I discuss several points that relate to the study's purpose and design.

In encounters of health professionals and patients, a difference in power between the participants invariably exists. Most often the professional is in control, but the professional's degree of power varies from situation to situation. The effective use of power within such an inequitable provider-patient relationship is necessary to apply interviewing skills and gather adequate content from a medication-history interview. The professional must understand and be able to use interpersonal skills in the patient's interest.

By using an interviewing (information-gathering) situation in this study rather than a counseling (information-giving) situation, I attempted to equalize the potential power differential between the patient and interviewer. Let me use the phrases "less powerful" and "more powerful" to explain this point. Within a gathering session, the "less powerful" patient has most (if not all) of the medication-history information the provider needs, thereby making the "more powerful" partner use the differential of his or her occupation to attain goals. In this study, the goals of the medication-history interview are good process, complete content, and a satisfied patient. In an information-giving session, however, the "more powerful" partner of the dyad has most (if not all) of the information needed by the "less powerful" patient. I believe a design in which the "less powerful" partner has the information that the "more powerful" partner needs

balances the information and power differentials inherent in provider-patient relationships. My research intent was not to study power and power differences, so I expected any differences to be minimized within an information-gathering design. This helped ensure that power differences would not be a confounding factor in the models.

A medication-history interview is often the first contact between a pharmacist and patient, and so the pharmacist conducting it has to meet the dual objectives of collecting information and establishing a relationship with the patient. As the profession of pharmacy moves from providing product-oriented services to informational services, one-on-one communications with patients are increasingly important.

Stewart (1984) discusses the dynamics of family practitioners' first interviews with patients, and her points may have some relevance for pharmacists. She, too, contends that a family practitioner's first or early-on interview with a patient could represent the beginning of a relationship, and maybe the provider should not expect too much openness from the patient. What is interesting about Stewart's assessment is that the physician's behavior on the initial visit may well be an investment for the future, setting the tone for the relationship and giving patients permission to express views and feelings. Given that family medicine is conducted during short visits over relatively long periods of time and that one of the principles of the specialty is continuity of care, the action of the physician and the reaction of the patient need not both occur in the same interview. The patient's reaction may more appropriately surface at a subsequent encounter if the patient is satisfied that "permission" has been given

by the provider.

As in family practice, patient encounters with pharmacists generally occur frequently, but are short. The extent to which pharmacists use medication-history interviews to establish relationships with patients differs by practice settings and by individual attitudes. While I believe Stewart's assessment of the dynamics of first encounters is applicable to pharmacist-patient medication-history interviews, I doubt whether it can be applied to my study. The use of simulated patients and the interview environment portrayed as real a situation as possible, but the simulated situation has limitations. It is unrealistic to think that the patient simulators viewed each interview as the opportunity to establish a continuing relationship with the interviewer. In this experimental situation, therefore, I would not expect the simulator to "hold back" information for subsequent visits, as Stewart suggests real patients would.

2. Measures

Retrospective review of the construction of variables and the models provides a fruitful framework for evaluating the results of any study and for generating ideas for further research.

Okubo's (1986) interviewing content evaluation form served the purpose of assessing the amount of drug information gathered in the medication-history interviews, and it offered advantages over similar measures used previously. One advantage is that is can be used with any medication history. In addition, the measure's equal weighting of the items avoids the temptation of predicting as an interviewer,

rater, investigator, or provider the most important pieces of information. Barbee et al. (1967), for instance, distinguished "most important areas" as those with $\underline{r} \geq 0.78$. However, one really does not know the relative importance of pieces of information, since information considered unimportant by an interviewer at the time of the interview may be very important to other users of the medication history and to future explanations of drug-therapy problems.

Okubo's form also incorporates an important concept lacking in other content evaluation forms, and that is the asking of screening questions to see whether a particular category of questions is relevant for a specific patient's history. The asking of screening questions is actually an element of interviewing process, but the answers to the screening questions provide useful clinical information. That is, without screening questions a clinician reviewing a medication history in a patient's medical record cannot determine whether the lack of check marks for a category means the patient had no relevant experience to report or that the pharmacist neglected to ask for that information. I believe any content evaluation form should incorporate screening questions.

Despite these advantages, I discovered several problems with Okubo's measure that I believe should be solved before applying it to research projects similar to mine in the future. First, I believe the evaluation form could be put in a format that is more "user friendly." For instance, I would construct the form using more descriptive phrases or questions, such as, "Did the interviewer collect the name of the medication(s)?," and the raters would check "yes" or "no." As

it stands, the form just lists one or two key words for each item, and the raters check those that were covered. By not requiring raters to mark a response for each item (i.e., yes or no), it is not possible to ascertain whether the raters specifically left items blank or simply did not finish completing the form; a closed-response format would give raters and investigators the opportunity to check for missing data on the content form. I believe that careful training of the raters, emphasis on accurate scoring, and efforts to avoid rater fatigue minimized the potential problem of skipped responses in this study; the form was shown to be reliable.

As another disadvantage, I believe Okubo's focus on drug information overlooks several other categories of content that pharmacists should gather in medication-history interviews. For instance, the form does not account for the interviewer's gathering of information relating to the patient's smoking and drinking behaviors, even though both of these can influence metabolism and potentiate side effects of some medications. As previously mentioned, the negative relationship between people and health-care orientation and interviewing content may be a function of not assessing items that the people-oriented students would have been likely to pick up, such as compliance problems and lifestyle habits.

It also should be noted that, while the flexibility of the evaluation form is an advantage since it can be used with any medication history, the flexibility also means that scores from one medication history cannot be compared with another. For instance, one patient's medication history may be very simple. The interviewer can ask all

five screening questions and receive "no" responses, meaning that the patient currently takes no medications, took no prescription and non-prescription medications within the last six months, and has no known drug allergies. Such an interview, even with a score of only 5, would be "complete." Another patient may have a very complicated drug history that includes multiple-drug regimens both currently and in the past, a noteworthy side effect profile, and drug allergies. An interviewer of this patient could get a score of 20 or 30 and still miss a lot of the pertinent information. When using Okubo's form for educational and training purposes, I suggest reporting the content scores as a percentage of the available information points in the medication histories. Such an approach may also be advisable when using the form for future research purposes, especially if the research involves comparing content from more than one history.

Some might criticize the interviewing process evaluation form for its attention to detail. The importance of the detail depends upon how finitely the results are interpreted and from what perspective.

The total interview skill score was fruitful for my study since it represents a continuous measure (rather than a dichotomous measure). In this way, the measure accounts for variance in the interviewers' skill level. Also, by identifying separate items in each of the six skill areas of opening, nonverbal behavior, verbal behavior, interviewing process, rapport and relationship, and closure, the measure attempts to capture the complexity of interviewing process; the result is much richer data than the response to a simple question like, "Does the interviewer exhibit rapport?"

The interviewing process evaluation form potentially offers the flexibility of analyzing either the total score (as I did) or the subscores of each of the six subsections. The subscores may be useful when the instrument is used for educational purposes, similar to Gardner and McGhan's (1986) use of ACIR-P subscale scores for evaluating the effect of educational programs for pharmacy students. Also, future research on interview skill subscores may shed light on gender differences, patient satisfaction expectations, and relationships with other determinants and their impact on other information-gathering behaviors.

Since the interviewing process evaluation form is an original instrument, it remains to be seen if the detail, no matter what the focus or goal of the study, is necessary. For example, in my study the three questions in the "overalls" subsection were eliminated from the final analyses. These three questions may prove to be as reliable as the total score in evaluations of process skills. Alternatively, the subcategory headings may themselves be scorable using the modified five-point Likert format; this approach would decrease the form from 19 items to 6 items. It remains to be demonstrated, however, whether simplification, alternative forms, or both would garner similar or enhanced results.

Researchers generally use one of two methods for evaluating the reliability and validity of study instruments. One approach involves pretesting the instrument on a small number of individuals, making any necessary changes based on the responses and feedback, and then administering the finalized instrument to the entire sample. The other

approach for evaluating study instruments involves psychometrically deleting items from the instruments after data from the entire sample are collected but before final data analysis. Both approaches are methodologically sound (Nunnally, 1978).

I used a modified pretest approach for finalizing the content and process evaluation forms. A group of pharmacy practitioners, educators, and researchers reviewed the forms for face and content validity, and then the rater panel used the forms in training sessions; based on discussions of discrepancies in scores, I refined the descriptive documents to help clarify interpretation and scoring procedures.

The patient satisfaction report was styled after the work of others as I previously reported. Several faculty members reviewed the instrument for face validity before its use by the patient simulators. The simulators expressed no difficulty in completing the form.

3. Models

I believe one of the highlights of this research project is that at the outset I developed theoretically and conceptually attractive models of factors affecting the outcomes of medication-history interviewing by pharmacy students and avoided the trap of testing every possible variable available. If there is one major concept missing from the models of medication-history interviewing outcomes that I would retrospectively consider including, however, it is a measure of the student's job or work history. I believe student work history, such as whether a student ever held a people-oriented job,

would be one way to operationalize a precursory socialization phenomenon that has potential to be a predictor of the different concepts of medication-history interviewing outcomes.

One theoretically determined predictor of medication-history interviewing outcomes, father's education, proved unfruitful in this study. Father's education was not a significant predictor of any variables in the models. Its zero-order correlations were also weak, the strongest one being a negative association with communication apprehension (r = -0.175).

Perhaps mother's or father's occupation or family income may be a better predictor of pharmacy student interviewing outcomes. Some evidence in the medical literature, for instance, showed father's occupation to be positively related with information-giving behavior (Waitzkin, 1985).

In future testing of these models, researchers should consider still other choices for operationalizing background variables. For instance, I think the background characteristic of whether the student was raised in a rural or urban setting could theoretically be predictive of the student's verbal and nonverbal interviewing skills and people and health-care orientation.

In analyzing the data I restricted the models by eliminating from the unrestricted equations any variable whose Beta coefficient had a level of significance greater than 0.10. An alternative method of "theory trimming" would have been to use the "Beta rule" approach, which means that only variables with Beta coefficients less than or equal to a predetermined value, such as 0.10, would be eliminated from

the equations (Pedhazur, 1982). This method is used in large demographic studies where significance levels prove meaningless in interpretation.

I used the significance rule of eliminating variables from the unrestricted models instead of the Beta rule because my sample was of meaningful size but not large by demography standards. The 0.10 level is liberal enough to allow for the inclusion of useful determinants and exclusion of less meaningful ones.

My decision also hinged on advice from Hoyenga and Hoyenga (1979, p. 368), who believe that researchers even remotely studying gender differences have to be aware of the limitations of basing decisions on correlation coefficients. They explain that in research on gender differences, it is risky to use one variable's correlation coefficient to predict another since coefficients of 0.20 to 0.30 are much more common in this type of research than correlations of 0.70. Discussions based on such correlational data are obviously tentative.

Research on gender differences, therefore, is complex and potentially sensitive to many competing variables. One way to approach this situation within my research would have been to sensitize my models using the Beta decision rule, thereby increasing the possibilities of influence that account for the complexity. Another approach would be to make conservative yet meaningful decisions about potential influential determinants and, in the process, eliminate possible additive effects. I chose the latter approach using the significance rule so as to control the possibility of over-interpretation.

The models of factors affecting outcomes of medication-history

interviewing by pharmacy students make a great deal of theoretical and intuitive sense. As Wasserman and Inui (1983) conclude, it is necessary to develop multifaceted analytic approaches that include the clinical goal and measures of the sequence, form, process, and content of the interaction. The models display the closeness and the distinct difference between the determinants of content and patient satisfaction. Both are dependent upon interviewing process in a significantly positive direction. Beyond that, the direction of the relationships and the determinants themselves vary for the dependent variables.

As constructed, the model with patient simulator satisfaction as the dependent variable has an adjusted $\underline{R}^2$ of 0.359, meaning that approximately 36% of the variance is explained. The model with interview completeness as the dependent variable has an adjusted $\underline{R}^2$ of 0.271, meaning that 27% of the variance is explained.

While I believe the temporal ordering of the variables in the models is appropriate, some may argue that the psychological trait of communication apprehension should be segregated into a temporal position of its own or be designated as an exogenous variable. Also, another case could be stated that a student's interviewing process leads to interviewing content, which in turn is associated with patient satisfaction. In other words, is interviewing content related to patient satisfaction? A preliminary secondary analysis of my data using regression and path analysis indicated that process leads to content and satisfaction, but content is not a predictor of patient satisfaction.

CHAPTER 5

SUMMARY AND CONCLUSION

A. Summary of Study Purpose and Proposed Models

The purpose of this research was to study factors affecting the outcomes of medication-history interviews by pharmacy students. The study aimed to determine whether pharmacy students' performance on a medication-history interview, measured using instruments developed to score levels of interviewing content and patient satisfaction, could be explained by structural equation models that included background, value, and attitudinal characteristics of the interviewer; gender of the interviewer and patient; the communication apprehension of the interviewer; and the interviewing process of the interviewer.

B. Summary of Findings

An interactional perspective of medication-history interviewing can help document how people categorize the world, as well as how they socially represent and accomplish purpose. I believe the two models of medication-history interviewing outcomes tested in this study lead to a preliminary understanding of how pharmacy students categorize their interviewing task, socially represent themselves to simulated patients, and accomplish the study's interviewing outcomes of process, content, and patient satisfaction.

The models are good representations of combining theory and practice. The patient simulator satisfaction model has an adjusted $\underline{R}^2$ of 0.359. The variables that directly influence patient satisfaction are

interview skill, people and health-care orientation, prepharmacy gradepoint average, and pharmacy student gender. All of these variables are positively associated with satisfaction, and all Beta coefficients except that of pharmacy student gender have significance values less than 0.05.

The second model with interview completeness as the dependent variable has four significant determinants: interview skill, people and health-care orientation, student gender, and patient simulator gender (adjusted $\underline{R}^2$ = 0.271). In this case all except one relationship are positive; people and health-care orientation is negatively related to completeness.

One benefit of a path analytic approach is that the model's predetermined temporal order allows independent variables from one analysis to be dependent variables on subsequent analyses. For example, interview skill, interviewing orientation, prepharmacy gradepoint average, and people and health-care orientation all are dependent variables with independent determinants that remained in the final multiple regression analysis.

Interview skill is positively and significantly associated with interviewing orientation and prepharmacy gradepoint average (adjusted $\underline{R}^2$ = 0.163). The three independent variables of people and health-care orientation, prepharmacy gradepoint average, and personal report of communication apprehension are significantly related to the dependent variable of interviewing orientation (adjusted $\underline{R}^2$ = 0.214); only one of the determinants, communication apprehension, represents a negative effect.

Both prepharmacy gradepoint average and people and health-care orientation are dependent upon the background variable of pharmacy student gender in the final analysis. For prepharmacy gradepoint average, the relationship is in a positive, but not significant, direction (adjusted $\underline{R}^2 = 0.019$). Being female, on the other hand, is positively and significantly related to the dependent variable of high people and health-care orientation (adjusted $\underline{R}^2 = 0.118$).

The most interesting results of the study involve the complex set of direct and indirect effects of student gender, professional orientation, prepharmacy gradepoint average, and interview skill on the outcomes of patient satisfaction and interview completeness.

While it was anticipated that people and health-care orientation would primarily affect the interviewing outcomes through its direct effect on the attitudinal measure of interviewing orientation, that is not the case. People and health-care orientation has little indirect effect through interviewing orientation on interview skill, completeness, and patient simulator satisfaction. Rather, professional orientation exerts a direct effect on completeness and satisfaction. People-oriented students collect less information and have more satisfied patients. Possibly the same factor accounts for these opposite effects--people-oriented subjects' attention to the social aspects of the interview instead of the information-gathering task.

Student gender also has a complex set of direct and indirect effects in the models. Women overwhelmingly chose pharmacy as a major for its people and health-care orientation, and being female is a predictor of professional orientation. Being female also has a posi-

tive effect on completeness and an indirect effect on satisfaction, the latter apparently working through people and health-care orientation. If gender differences in communication exist, one would expect to see a direct relationship between student gender and interview skill; this study shows no such relationship.

Just as academic ability showed inconsistent effects on interviewing outcomes in studies with medical students, it shows mixed results in this study. Prepharmacy gradepoint average directly influences interviewing orientation, interview skill, and patient satisfaction. It has only an indirect effect on completeness.

In summary, the models display the closeness and the distinct difference between the determinants of interviewing content and patient satisfaction. As such, it appears that the models represent behavioral outcomes of medication-history interviewing at two levels: patient assessment of competence in terms of satisfaction and clinician assessment of competence in terms of completeness. Both outcomes are dependent upon interviewing process in a significantly positive direction.

C. Implications of the Study

To be effective, health-care professionals need good communication skills. They must be able to put patients at ease, promote trust and confidence, and obtain complete accounts of current problems and past medical histories. Without these communication skills, health providers may base diagnostic and therapeutic decisions and counseling sessions on inadequate data.

Before discussing implications of this study, I wish to emphasize that no one study captures all the relevant independent or dependent variables. Factors either not measured within this study's design or not included in analyses may influence the quality of interviewing outcomes. The variances explained by the two models in my study fall far from 100%. In fact, the amount of variance explained in virtually all research is less than 100%. So, while I propose several implications of the results of my study, I also present queries and arguments directed at unexplored factors that may influence the levels of unexplained variance associated with my two models.

In my study, interviewing process, defined as interview skill, has strong positive effects on the interviewing outcomes of patient satisfaction and interviewing completeness. Accepting Eakins and Eakins' (1978, p. ix) assertion that human communication skills and abilities can be taught and modified, this finding has an important educational implication for the training of future pharmacists and for the practice of pharmacy. Of the independent variables in the models, only interview skill can realistically be manipulated, unless, for example, one argues for admissions standards allowing only women, people-oriented students, and students with high prepharmacy grade-point averages into pharmacy programs. I would not support such criteria. Interviewing training programs conducted in an educational setting for pharmacy students may enhance the students' interviewing skills, thereby improving their future ability to develop satisfying relationships with patients and strategies to collect more complete medication histories.

While this study did not include an evaluation of an educational intervention, the study method could be easily adapted for that purpose. The method offers great flexibility for teaching and research purposes. For example, student performance on different medication histories could be tested before and after educational programs, similar to Gardner and McGhan's approach (1986). Also, by altering the content evaluation form, the student's ability to identify compliance problems in a medication history could be assessed. In addition, the "hard copy" of the interviewer's reported results on the medication-history record form could be compared with the results of the clinical panel's assessment of the videorecorded interview; alternatively, the students' evaluation of their behaviors could be compared with the independent ratings of patients, clinicians, or both. Finally, videotapes, students' notes, and patients' medical records could be reviewed to compare the information transferred orally, the information initially recorded as a result of the interview, and the information subsequently recorded in the medical record for others to use.

Keeping within this theme of the study's practical implications, let me turn to the negative relationship between the students' orientation to pharmacy and their interview completeness scores. I believe that the explanation mentioned previously about people-oriented students' focus on the social interaction instead of on the information-gathering task makes intuitive sense. Still, I am struck by this relationship, and it is possible that other factors not examined in the models may be operating. Since the measure of completeness used in this study does not assess what amount or type of medication infor-

mation is clinically important, is it possible that the gathering of one data point is more clinically important than another? If so, is it possible that students with a people and health-care orientation obtained the most important information even though they obtained lower completeness scores? As a corollary, is it possible that these students collected a lot more pertinent information than could be recorded on the form?

Such questions provide fodder for future research, but I believe all except the last explanation are possible but unlikely. Okubo (1986) developed the content evaluation form based on what hospital and clinic pharmacists considered to be clinically important information; therefore, I assume that all content points in the final version of the instrument are relevant and important. Beyond that, accenting specific areas for scrutiny in advance may destroy the "surprise" factor that can occur in any interview. The surprise factor that makes a great news story for a reporter may be similar to the surprise factor that may be the key to a "great" history for an interviewer. One of the cautions associated with establishing a what-is-important list is becoming blind to the unexpected. Medication-history interviewing requires the interviewer to be prepared for the expected and unexpected, to know the difference between the two, and to be aware of specific points that may carry considerable meaning to others using the information.

A people and health-care orientation does lead to greater patient simulator satisfaction, and research reported previously presents evidence that patient satisfaction may enhance patient compliance, a

therapeutic outcome. Another future research question would examine the relationship of (1) a professional orientation concept, such as a people and health-care orientation; (2) interviewing outcome concepts, such as process, content, and respondent satisfaction; and (3) a therapeutic outcome, such as patient medication compliance. Since professional orientation was such an influential factor in explaining interviewing behaviors, it would be interesting to see its effect on the ultimate target of those behaviors--therapeutic outcome.

Another precursory variable from the two models deserves mention in this implications section. The students' apprehension toward communication was measured using the PRCA scale as discussed earlier. Berger, Baldwin, McCroskey, and Richmond (1982) show that "apprehensive" students (as so designated by their scores on the communication apprehension scale) exposed to a systematic desensitization program are less apprehensive about communicating (as shown by a lower PRCA score after the intervention).

My study showed that the communication apprehension trait does not have a direct effect on any of the three interviewing outcome variables of process, content, and patient satisfaction. Thus, implementing systematic desensitization training as the authors recommend may lower a student's overall apprehension toward communication, but such training does not seem to be the only answer. As shown by the models of interviewing behavior in my study, a more fruitful educational approach would be to focus on enhancing interview process skills rather than on reducing communication apprehension.

D. Future Research

It is amazing to experience firsthand the birth of myriad research ideas from a single project. My ideas for future research include several main points, in addition to those mentioned earlier in this chapter and in Chapter 4.

First, the relationship of gender differences and medication-history interviewing outcomes deserves more study. Maybe I underrated both the complexity and specificity of the relationships between personality dimensions and particular gender-role behaviors and preferences. Specific research priorities for further examining gender's effect on the outcomes of medication-history interviewing by pharmacy students in the future are as follows:

1. Control for students' perceptions about sex roles in general and in pharmacy specifically;

2. Examine subscores on the interview skill measure for differences between male and female interviewers and for differences between male and female raters;

3. Test the model of interviewing completeness using a measure of completeness that includes lifestyle and compliance content points, as well as medication data;

4. Examine the effect of interviewer gender on patient satisfaction by having a trained male and female pharmacy interviewer conduct medication-history interviews with a large number of actual patients.

5. Examine whether the effects of people and health-care orientation on attitude toward interviewing, satisfaction, and completeness would hold up in an analysis of men only.

Another avenue of future research is to study factors affecting medication-history interviewing outcomes of pharmacy students by varying patient characteristics, such as status, educational level,

cultural background, and whether the patient is an actual one or a simulator. Pharmacists' role behaviors may change depending on the patient's sociodemographic background, medical condition, and actual versus simulated status. In my study, the only patient characteristic included in the model of factors affecting outcomes of medication-history interviewing by pharmacy students was gender. The reasons why students who interviewed the woman patient simulator gathered more content merit further study.

It may also be fruitful to assess other characteristics of the student interviewers, such as past work experience and parents' occupation.

A third avenue for future research is an especially elusive, but challenging one. It boils down to this basic question: Is good communication process "enough" in a provider-patient encounter? Inui and Carter (1985) contend that maximum patient satisfaction occurs when the physician discovers and deals with patient concerns and expectations directly, communicates with apparent warmth and interest, and volunteers a good deal of information in language that the patient understands. The Korsch group (Korsch et al., 1968; Freemon et al., 1971; Korsch and Negrete, 1972) supplies evidence that patients may be more satisfied and express their concerns to a friendly practitioner.

I wonder, though, at what point these somewhat elusive "good" aspects associated with terms such as likability, friendliness, or approachability, fall short of producing a positive outcome. Or, at what point does communication process as a whole fall short of producing a positive outcome? For example, would a patient accept

advice from or give information to an approachable pharmacist who is rated clinically "low" in measures of content, knowledge, or technical competence but "high" in measures of process outcomes? Likewise, would a patient accept information from or give information to an unapproachable provider who is judged "high" in measures of content, skill, or technical competence?

This leads me to a fourth area of future research, this one dealing with the effect of communication behaviors on therapeutic outcomes. More research is needed to examine the relationships among interviewing behaviors, counseling behaviors (the usual next step after interviewing), and patient compliance (the ultimate goal of the previous activities). Such relationships are difficult but possible to tap. Croog and colleagues (1986), for instance, found that different antihypertensive drugs influence various aspects of the patients' quality of life--one obvious therapeutic outcome--and that these can be meaningfully assessed through the use of psychosocial measures.

Another area for research is how provider-provider interaction and communication affect a patient's therapeutic outcome. A study of patient survival in intensive-care units at 13 hospitals showed, for example, that the primary determinant of patient outcome was not technology but the interaction and coordination of each hospital's intensive-care unit staff (Knaus et al., 1986). In other words, it was the existence of good communication between physicians and nurses. Similar positive outcomes relating to drug therapy may result from good communication between pharmacists and other health professionals. More research is necessary to identify and quantify factors affecting

interprofessional communication about drug therapy, and then assess the effects of this on patient care.

Last but not least, for educational purposes it would be worthwhile to examine further the interviewing behaviorial measures of process and content. For instance, segmenting the content information into subscores may identify areas in which students and pharmacists are deficient, and this type of information may be useful in designing educational modules.

In addition, it would be interesting to compare clinician raters' perceptions about appropriate interviewing techniques (especially when dealing with a large pool of preceptor-instructors) and their evaluations of student performance. In this vein, after my study was completed, Boh and Ploetz (1986) prepared a staff development program for pharmacy preceptors at the University of Wisconsin Hospital and Clinics, the School of Pharmacy's major inpatient clerkship site. The program, which was patterned after my research project, sensitized the preceptors to the interviewing project that the incoming group of students experienced so that the preceptors could serve as better role models and evaluators.

E. Limitations

A number of limitations associated with this research project were outlined in Chapter 3. Rather than repeating the limitations, let me simply reinforce the need to keep the limitations in mind when interpreting the results of this study. As I stated previously, I believe the proposed models, methods, and analyses are valuable and

shed light on a previously unexamined problem in a new way. The research design balances as best as possible the methodological principles of internal and external validity.

F. Conclusion

An interviewer's job is divided essentially into two parts. The first is a function of interviewing process since it deals with assuring or increasing the validity and reliability of information given by respondents. The second part dealing with obtaining relevant and complete information is a function of interviewing content.

How important is medication-history interviewing to pharmacy? It is very important, especially as pharmacists assume expanded clinical roles. As of May 1986, for example, pharmacists in Florida have authority to prescribe approximately 30 drug products listed in a state-approved formulary (Anon., ASHP Newsletter, 1986). Recording the patient's history is a requirement under this new state law.

Medication-history interviewing is also important considering the profession's movement away from a product-based focus to an information-based focus. Two recent national studies illustrate the potential for pharmacy's involvement in an information clearinghouse role (Anon., American Journal of Hospital Pharmacy, 1984; Anon., The CBS Consumer Model, 1984). Good communication skills are necessary to perform information roles effectively.

The study of factors affecting medication-history interviewing--one aspect of communication behavior--is as important as confirming a need for it, "selling" it as a necessary part of practice to current

pharmacists, and evaluating the effectiveness of education and training programs for pharmacists and pharmacy students. Knowledge of what factors are correlates of interviewing outcomes should help in organizing educational modules that are sensitive to the approach presented here.

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APPENDIX A

Informed Consent Agreement

University of Wisconsin Madison

CENTER FOR HEALTH SCIENCES
School of Pharmacy
425 North Charter Street
Madison, Wisconsin 53706
Telephone: 608/262-1416

INTERVIEWING SKILLS STUDY

The purpose of this study and exercise is to gain a better understanding of the factors associated with interviewing skills and how they can be taught. Participants in the study will be asked to fill out a questionnaire in addition to completing a simulated patient interview. This interview will be videotaped and evaluated by the study coordinator, Mr. Ranelli, and the interview will take place at the University of Wisconsin-Madison Clinical Sciences Center.

I understand that the questionnaire data will become part of an anonymous file and the research reports will not contain information which could identify me, my standing in school, my fellow students, the simulated patients, or other persons with whom I have contact.

The study coordinator, Mr. Ranelli, has offered to answer my questions concerning this study and the measures that will be taken to protect my right and welfare as well as those of my colleagues. Also he will share with me an evaluation of my results from this interviewing skills study when they are available.

Authorization: I, _____, read the above and will
(please print)
participate in the study described above. My signature also indicates that I have received a copy of this consent form.

_____ _____
Signature Date

Sincerely yours,

Paul L. Ranelli
Study Coordinator
Social Studies of Pharmacy

Bonnie L. Svarstad, Ph.D.
Associate Professor of
Social Studies of Pharmacy

October 1984/plr

APPENDIX B

Student Handout on the Patient's Social and Family History

SOCIAL ASPECTS OF PHARMACY
Pharmacy 610 Fall 1984
University of Wisconsin-Madison

MEDICATION-HISTORY INTERVIEW SIMULATION

Patient Name _____

Age _____ Weight _____

Today's blood pressure 140/90

Situation:

After reading an article about how pharmacists can perform more complete and accurate medication histories, Dr. Paul has requested that you attend the General Internal Medicine Clinic at University Hospital (K6 module, third floor). When you are there, he would like you to perform a medication interview on all patients that he is seeing that day.

NOTE: Even though this exercise is a simulation, it is real. So, all points about professionalism, professional decorum, and patient confidentiality apply.

Brief Medical History:

This is the second visit to the General Internal Medicine Clinic at University Hospital for this patient. At the last visit, 6 months ago, this patient was diagnosed as having essential hypertension (BP 155/95) and was started on a medication treatment plan. Prior to this time the patient has had no medical problems other than the usual "cold and flu symptoms."

Social/Family History:

The patient is employed as a manager for a large computer software company in Madison. Company business requires that the patient travel frequently, 2-3 times/week overnight on business. The average work week consists of approximately 55 hours/week. The patient is a very organized individual. When not working, the patient is a gourmet cook, and loves to eat at various establishments to sample the food. Fast food chains are always avoided. The patient has smoked 1 pack per day for 10 years and occasionally drinks 1-2 cocktails after business meetings. The patient drinks about 4-5 cups of coffee/day. The patient is married and has 2 children.

APPENDIX C

Free-Flowing Scripted History Given to Simulators

(Containing two alternate compliance problems)

SOCIAL ASPECTS OF PHARMACY
Pharmacy 610 Fall 1984
University of Wisconsin-Madison

PHARMACIST-PATIENT SIMULATION: MEDICATION-HISTORY INTERVIEW
PATIENT SIMULATOR'S INFORMATION

Patient Name _____

Age _____ Weight _____

Today's blood pressure 140/90

WHO ARE YOU? Character description (occupation, social, personal history)

--Manager for a computer software firm
--Frequent traveler, 2-3 x per week, overnights
--Smokes one (1) pack per day for 10 years
--Drinks 1-2 cocktails after business meetings
--Enjoys gourmet cooking
--Does not like fast-food outlets
--Drinks about 4-5 cups of coffee per day
--In general, a very organized person
--Married, 2 children
--Medical problem: hypertension (high blood pressure) for past 6 months
--Other medical history: negative, nothing to report, basically healthy
--Situation: This is your second visit to the General Internal Medicine Clinic at University Hospital. At the last visit 6 months ago, you were diagnosed as having essential hypertension (blood pressure 155/95) and started on a medication treatment plan. Prior to this time you've had no medical problems other than the usual "cold and flu symptoms."

I. Medical History -- Prescription Drugs

--Hydrodiuril (brand name)
--Hydrochlorothiazide (generic name)
--50 milligrams of drug per tablet
--You take it by mouth
--Prescribed directions: one (1) tablet twice a day (morning on awakening and mid-afternoon). Therefore, it's a scheduled drug.
--Have been taking drug for four (4) months
--You took one dose today
--Purpose of medication: to help control blood pressure
--The medication seems to be working

II. Medication History -- Over-the Counter (OTC) Drugs
--Aspirin 325 mg tablet. Take two (2) to four (4) or four (4) to six (6) tablets a day for headaches. Headaches come from working too hard. Took two (2) tablets today, if any.
--Multivitamin with iron. Take two (2) every day. Started one (1) month ago.

III. Prescribed Medications in Past Six (6) Months
--None

IV. Drug Allergies/Adverse Drug Reactions
--Penicillin 250 mg tablets, one (1) year ago for cold. Developed severe itchy rash over upper and lower trunk. Stopped medication.
--Have never been rechallenged (i.e., received the medication again).

V. Social Drugs (alcohol, smoking)
--See history, nothing unusual to draw on.

SETTING: Patient seen in outpatient clinic for second visit after being diagnosed with hypertension 6 months ago. Simulators: be well versed in both scenarios. You'll be asked to do each of them.

SCENARIO 1: Chief complaint for this visit is - Leg pain especially at night (caused by low potassium level)

--The leg pain started two (2) months ago
--Increasingly worsened over past 2 weeks
--You experienced no change in skin color or swelling
--You started vitamins to relieve the cramping
--The cramping keeps you awake at night
--You like to salt food even after cooking
--You do not use a lo-lite salt (which contains potassium)
--You don't drink orange juice, or eat bananas (which also contain potassium)
--No potassium supplementation in either food or by way of medication

Because of the leg cramping, you've missed a dose, or two, or three occasionally. Your leg cramping gets better when you stop or skip doses. (The reason why is that the prescribed drug depletes potassium, and you may need some sort of potassium supplement. The interviewer may suggest that possibility and will discuss it with your doctor.)

So, you are a recently noncompliant patient because of a side effect, the leg cramps. You understand the drug is necessary to

lower your blood pressure and that it is working, but the leg cramping decreases your motivation to comply. You can't tie in the drug with the leg cramping, however.

SCENARIO 2: Chief complaint for this visit is - <u>frequent awakenings at night</u> (a legitimate effect from the drug, but annoying)

--It started two months ago, awaken at 2-3 am
--Go to bathroom then fall back to sleep within 2-3 hours
--Because of business and being busy you forget your morning dose of the prescribed drug because you are usually late for work in the morning
--You take your prescribed medication once a day instead and you take it when you can remember it
--You remember it at bedtime after a long day of work, travel, or business meetings. Bedtime is around 11-11:30 pm

In this instance your understanding about the medication, what it does, and when to take it is lacking. You are motivated to take the medication because you want to control the blood pressure, but your forgetfulness, life style, and job commitments seem to get in the way. You are concerned about not following directions and the effects on your blood pressure (albeit ok for now). However, you are close to wit's end and your motivation is decreasing <u>but not lost</u>.

You seek an increased understanding that frequent urination will occur with a diuretic, but that by taking it at the proper times and according to the regimen the blood pressure will remain in control and the wakings at night as a result of the diuretic will disappear.

October 1984/plr, 1b

APPENDIX D

Communication Apprehension Survey

Student Name _____

Student I.D. _____

Section _____

PART 1: REPORT OF COMMUNICATION APPREHENSION[1,2]

This report of communication apprehension is composed of 30 statements concerning your feelings about communication with other people. Please indicate in the space provided the degree to which each statement applies to you by marking 1 (strongly agree), 2 (agree), 3 (undecided), 4 (disagree), or 5 (strongly disagree). There are no right or wrong answers. Many of the statements are similar to other statements. Do not be concerned about this. Work quickly, just recording your impression.

__ 1. I dislike participating in group discussions.
__ 2. Generally, I am comfortable while participating in group discussions.
__ 3. I am tense and nervous while participating in group discussions.
__ 4. I like to get involved in group discussions.
__ 5. Engaging in a group discussion with new people makes me tense and nervous.
__ 6. I am calm and relaxed while participating in group discussions.
__ 7. Generally, I am nervous when I have to participate in meetings.
__ 8. Usually, I am calm and relaxed while participating in meetings.
__ 9. I am very calm and relaxed when I am called upon to express an opinion at meetings.
__ 10. I am afraid to express myself at meetings.
__ 11. Communicating at meetings usually makes me uncomfortable.
__ 12. I am very relaxed when answering questions at meetings.
__ 13. While participating in a conversation with a new acquaintance, I feel very nervous.
__ 14. I have no fear of speaking up in conversations.
__ 15. Ordinarily, I am very tense and nervous in conversations.
__ 16. Ordinarily, I am very calm and relaxed in conversations.
__ 17. While conversing with a new acquaintance, I feel very relaxed.
__ 18. I'm afraid to speak up in conversations.
__ 19. I have no fear of giving a speech.
__ 20. Certain parts of my body feel very tense and rigid while I give a speech.
__ 21. I feel relaxed while giving a speech.
__ 22. My thoughts become confused and jumbled when I am giving a speech.
__ 23. I face the prospect of giving a speech with confidence.
__ 24. While giving a speech I get so nervous, I forget facts I really know.

[1]Source: H. J. Baldwin et al., "Understanding (and Conquering) Communication Apprehension," Patient Counseling in Community Pharmacy, Vol. 2, No. 2, Nov./Dec. 1983, p. 11.

[2]To compute your scores:

1. Make a separate total of the following items:
   2, 4, 6, 8, 9, 12, 14, 16, 17, 19, 21, 23. Total 1 = _____
2. Make a separate total of the following items:
   1, 3, 5, 7, 10, 11, 13, 15, 18, 20, 22, 24. Total 2 = _____
3. Your PRCA Score = 72 + Total 1 - Total 2.
   Above 79 = High CA; below 52 = Low CA;
   52-79 = Normal CA. PRCA Score = _____

PART 2: MISCELLANEOUS QUESTIONS

1. What is your current status?
   ____ PH-1
   ____ PH-2
   ____ PH-3

2. Where did you complete your externship?
   ____ Independent community pharmacy
   ____ Clinic or prescription pharmacy
   ____ Chain pharmacy
   ____ Hospital or institutional pharmacy
   ____ Have not completed my externship

3. Are you a male or a female?
   ____ Male
   ____ Female

4. What was your most important reason for choosing pharmacy as a major?
   ____ Thought there would be good job opportunities
   ____ Liked working with people and wanted to be in a health profession
   ____ Liked subjects such as chemistry and thought pharmacy would be challenging
   ____ Other

5. What would you like to be doing in 10-15 years?
   ____ Working in a community pharmacy setting
   ____ Working in a hospital or institutional pharmacy setting
   ____ Working as a sales representative
   ____ Teaching and doing research in a college or university setting
   ____ Doing research in an industrial setting
   ____ Working in a government position
   ____ Other

APPENDIX E

Medication-History and

Interviewing Attitude Survey

Interviewing Code No. _____

Social Aspects of Pharmacy
Pharmacy 610 Fall 1984
University of Wisconsin-Madison

Medication-History and Interviewing Attitude Survey

The numerical code in the upper right-hand corner identifies you ONLY to the study coordinator. It is not being used to identify you as an individual; your responses are strictly anonymous. The data obtained from this survey will be shared with the class as a whole at a later date. But, as mentioned previously, individual results will not be identifiable.

Your views are important for the success of this part of the interviewing module. Your cooperation is appreciated and needed to make this interviewing experience enjoyable, insightful, and worthwhile for you, me, and your colleagues.

There are no right or wrong answers to the questions in this survey. Many statements are similar to other statements; do not be concerned about this. Read each of the following statements and assign a number from 1 through 5 depending upon your degree of agreement with the statement. Honest and candid responses are extremely important. The numbers to be assigned are as follows:

5 = Strongly agree
4 = Agree
3 = Uncertain
2 = Disagree
1 = Strongly disagree*

__ 1. Doing a medication-history interview has value.

__ 2. A medical student is better qualified than I am to interview patients about their medication history.

__ 3. The results of the interview should be graded to separate the better students from the rest.

__ 4. The medication interview takes too much of my time.

__ 5. Conducting medication histories is a necessary part of the pharmacist's job.

__ 6. A good interviewer uses eye contact to help build patient trust.

__ 7. I have an incentive to do well in this medication interview.

---

*Reverse coded items: 2, 4, 8, 15, 16, 17, 18, 21, 23, 27, 29, 32, 33, 34.

5 = Strongly agree; 4 = agree; 3 = uncertain; 2 = disagree; 1 = strongly disagree

__ 8. Assessing a patient's understanding of their medication-taking experience is of little value to a successful interview.

__ 9. I am more qualified than a nursing student to interview patients about their medication history.

__ 10. A good interviewer should probe a patient's motivations.

__ 11. The four hours of classroom instruction on interviewing prepared me for this medication interview.

__ 12. To complete a successful interview, it is important to understand why patients do not take their medications.

__ 13. Introductions using the patient's and my name will assist in my developing good rapport with the patient.

__ 14. Receiving feedback on how well I conducted the interview is important.

__ 15. Open-ended questions during a medication interview yield less information than direct or forced-choice questions.

__ 16. Focusing on process skills will prevent me from getting the necessary drug information.

__ 17. The medical and social information I gather from a medication interview is not important because it is usually available elsewhere.

__ 18. I am concerned about being too cold and mechanical during the interview.

__ 19. A good interviewer explains to patients why the interview is being conducted.

__ 20. A medication interview is necessary to gather medical and social information about the patient.

__ 21. For an interview to be successful, the interviewer should know the patient personally before the interview.

__ 22. The content gathered during a medication interview is as important as the process used.

__ 23. I lack sufficient knowledge about drugs to complete a good interview.

__ 24. A patient-oriented communications course should be provided in the pharmacy school curriculum.

__ 25. Paraphrasing to clarify a patient's responses is necessary for a successful interview.

__ 26. Good closure of an interview establishes opportunities for patient feedback.

5 = Strongly agree; 4 = agree; 3 = uncertain; 2 = disagree; 1 = strongly disagree

__ 27. I suspect that the pressure to get the work done will prevent me from applying my communication skills in my future pharmacy practice.

__ 28. Good interviewing techniques will only be achieved with time and experience.

__ 29. Knowledge about drugs is more important than knowledge about the people taking drugs.

__ 30. Being attentive to nonverbal cues will facilitate the interview.

__ 31. Perceiving a patient's point of view is a necessary skill for a good interviewer.

__ 32. I have not prepared myself for this interview.

__ 33. Real patients would be easier to interview than simulated patients.

__ 34. My nervousness will prevent me from doing a good job interviewing.

The following questions are about you and your personal and family background. I ask these questions so that your experiences can be compared with individuals with similar backgrounds. This information, like everything else on this survey, will only be used for study purposes. It will be kept confidential.

35. Do you have a previously obtained college degree in another field? (Check one.)

(0)___No
(1)___Yes

If yes, in what field? _____

36. Specify the number of courses that you took <u>during high school</u> in each of the following areas (do not include extracurricular activities):

	<u>No. of Courses</u>
Communication arts. . . .	_____
Journalism.	_____
Social studies.	_____
Speech.	_____
Theatre and drama	_____

37. Specify the number of courses that you took <u>during college</u> in each of the following areas (again, do not include extracurricular activities):

	No. of Courses
Anthropology.	_____
Communication arts. . . .	_____
Journalism.	_____
Psychology.	_____
Sociology	_____
Speech.	_____
Theatre and drama	_____

38. Please specify using the scale below the extent of your involvement in the following extracurricular activities during either high school or college:

0 = None
1 = A little
2 = A fair amount
3 = Quite a bit
4 = A very great deal

___Class leader
___Debate
___Film (as a performer)
___Public speaking club
___Radio (as a performer)
___Reporter
___Television (as a performer)
___Theatre and drama (as a performer)

39. Here are two composites of individuals' experience in working with the public. After reading the examples, rate yourself on a scale of 1 to 10 in terms of the overall level of public contact and public service you have gained through your job experiences.

A rating of ONE (1) would represent someone like this: I have not worked much, but when I did I always worked by myself or only with a few other people. I have never worked in a job where I had much contact with the public. Here are some jobs that I held: painter's helper, laboratory worker, factory worker, warehouse packer, unit dose cart filler.

A rating of TEN (10) would represent someone like this: I have a considerable amount of work experience for a college student my age, and I have <u>always</u> worked at jobs where I served the public. Here are some jobs that I held: store clerk (department store, grocery store, and pharmacy), receptionist, product demonstrator, waiter, resort worker.

Based on these composites defining the 1 to 10 scale, specify your rating of your public contact and public service gained through your job experiences (use whole numbers please): _____

40. What percentage of those job experiences considered in answering the previous question put you in contact with patients? _____%

41. During high school or college have you ever been interviewed or conducted an interview? Do not count your experiences in Social Aspects of Pharmacy. (Check all that apply.)

(0)___No
(1)___Yes, I have been interviewed ___ times.
(2)___Yes, I have been an interviewer ___ times.

42. Are you (0)___Male (1)___Female

43. How old were you on your last birthday? _____

44. What is your marital status? (Check one.)

(0)___Single
(1)___Divorced
(2)___Separated
(3)___Married
(4)___Widowed

45. What is your most recent cumulative GPA (gradepoint average). Please record it to the nearest tenth (for example, 3.2). _____

46. What was your prepharmacy GPA? _____

47. Which of the following best describes the community that you considered home during your high school days? (Check one.)

(1)___Farm or open country
(2)___A village under 2,500
(3)___A town of 2,501 to 10,000
(4)___A city of 10,001 to 50,000
(5)___A city over 50,000

48. Are you a United States citizen?

(0)___No
(1)___Yes

49. Is English your native language?

(0)___No
(1)___Yes

50. What is the highest grade in school your father and mother completed? (Circle one number for each parent.)

	FATHER	MOTHER
8th grade or less	1	1
9th, 10th, or 11th grade	2	2
12th grade (graduated from high school)	3	3
Completed one to three years of college or technical school	4	4
Graduated from college (B.S. or B.A.)	5	5
Had some postgraduate training	6	6
DON'T KNOW	7	7

51. What were your parents' occupations, if any, while you were in high school?

Mother's occupation: _____

Father's occupation: _____

52. Have you had experience with public contact and serving the public in the full-time or part-time jobs you held?

(0)___No
(1)___Yes

53. Please specify using the scale below the extent of public contact you have had with the full-time or part-time jobs from the previous question? _____

0 = None
1 = A little
2 = A fair amount
3 = Quite a bit
4 = A very great deal

CONGRATULATIONS. You're done with this survey.

Thank you.

October 1984/plr

APPENDIX F

Patient Simulator Satisfaction Report

SOCIAL ASPECTS OF PHARMACY
Pharmacy 610 Fall 1984
University of Wisconsin-Madison

PERCEPTIONS OF MEDICATION INTERVIEW BY PATIENT SIMULATORS

Read each of the following statements and assign a letter from "A" through "E" depending upon your degree of agreement with the statement. Honest and candid responses are extremely important. The letters to be assigned are as follows:

A = Strongly agree
B = Agree
C = Uncertain
D = Disagree
E = Strongly disagree

____ The purpose of the interview was made clear.

____ The questions or statements were clearly stated, for the most part.

____ The questions or statements, for the most part, were not relevant to the stated purpose.

____ The interviewer was a good listener.

____ *I felt uncomfortable; rapport with the interviewer was not good.

____ I felt free to be honest and candid.

____ I felt free to offer my own ideas.

____ *The time taken to attempt to accomplish the interviewer's goal was too short.

____ The interviewer articulated and enunciated clearly.

____ *The interviewer's responses were not useful in making the interview flow.

____ *The interviewer did not respect me or my problems.

____ *The treatment given to me by the interviewer was impersonal.

____ The interviewer was prepared.

____ *The interviewer was too talkative.

____ I felt warmth from the interviewer.

____ *The interviewer went "overboard" with concern for me.

____ For the most part, the interviewer used appropriate eye contact.

____ *The interviewer was nervous and uncomfortable.

Comments:

*Reverse coded items.

October 1984/plr

APPENDIX G

Interviewing Content Evaluation Form

INTERVIEW CONTENT EVALUATION FORM

Interviewer Code _____ Videotape Number _____ Interview Number _____

Reviewer's Name _____ Reviewer Code _____ Date of Review ___/___/___
Mo. Day Year

CURRENT PRESCRIPTION MEDICATIONS (ASD)

	A	B	C	D	E
Name of medication					
Dose or strength					
Schedule (tid, qd...etc., -or- prn)					
Actual vs. Prescribed use					
Gathers data describing course of therapy					
Reason for use					
Effectiveness as stated by patient					
Assesses S.E. and/or adverse rxns					

CURRENT NONPRESCRIPTION MEDICATIONS (ASD)

	A	B	C	D	E
Name of medication					
Dose or strength					
Schedule (tid, qd...etc, -or- prn)					
Assesses S.E. and/or adverse rxns					
Gathers data describing course of therapy					

PAST PRESCRIPTION/NONPRESCRIPTION (ASD)

	A	B	C	D	E
Name of medication					
Why medication was stopped					
Reason for use					
Dose or strength					
Schedule					

S.E. PAST MEDICATIONS (ASD)

	A	B	C	D	E
Name of medication					
Dose or strength					
Description of side effect					

ALLERGIES PAST MEDICATIONS (ASD)

	A	B	C	D	E
Name of medication					
Description of reaction					
Determines if patient was rechallenged					
Determines actions taken					

COMMENTS

A = Aspirin _____

B = Vitamin _____

allergy to penicillin..... Yes No

allergy to Sulfas..... Yes No

allergy to Iodine..... Yes No

allergy to Vaccines..... Yes No

The interviewer determines whether the patient has any difficulty taking the drug (for example, difficulty remembering, missing doses).... Yes No

The interviewer determines whether the patient has any concerns or problems with the drug(s)..... Yes No

The interviewer gives incorrect information..... Yes No

Comments: _____

APPENDIX H

Interviewing Process Evaluation Form

PART THREE. INTERVIEW BEHAVIOR EVALUATION FORM

Interviewer Code _____ Videotape Number _____ Interview Number ____:____

Reviewer's Name _____ Reviewer Code _____ Date of Review __/__/__
No. Day Year

SCORING: 1 = Poor 2 = Needs Improvement 3 = Good 4 = Very Good 5 = Excellent

		Comments
A. OPENING		
1. Introduction; names exchanged; role; purpose; reason for visit; duration	1 2 3 4 5	_____
2. Asked for the patient's height and weight during opening	__ No (1) __ Yes (8)	
B. NONVERBAL BEHAVIOR		
1. Eye contact; facilitations; mannerisms	1 2 3 4 5	_____
C. VERBAL BEHAVIOR		
1. Open and Closed Questions	1 2 3 4 5	_____
2. Leading or Loaded Questions	1 2 3 4 5	_____
3. Double or Multiple Questions	1 2 3 4 5	_____
4. Question Repetition	1 2 3 4 5	_____
5. Jargon and Terminology	1 2 3 4 5	_____
6. Vocal Qualities	1 2 3 4 5	_____
D. INTERVIEWING PROCESS		
1. Flexibility; Logic; Transitional Phrases	1 2 3 4 5	_____
2. Pacing & Flow	1 2 3 4 5	_____
3. Interruptions	1 2 3 4 5	_____
4. Clarification & Verification	1 2 3 4 5	_____
E. RAPPORT & RELATIONSHIP		
1. Presentation Confidence	1 2 3 4 5	_____
2. Reinforcing Cooperation	1 2 3 4 5	_____
3. Responses to Patient Problems and Concerns	1 2 3 4 5	_____
4. General Attitude	1 2 3 4 5	_____
F. CLOSURE		
1. Summarization	1 2 3 4 5	_____
2. Feedback; Further Questions & Good-Byes	1 2 3 4 5	_____
G. OVERALLS		
1. I would rate this interview as	1 2 3 4 5	_____
2. The interviewer's control of visible "nervousness" was	1 2 3 4 5	_____
3. The interviewer's person-oriented approach was	1 2 3 4 5	_____

APPENDIX I

Test Items and Detailed Descriptions for Evaluating the Interviewing Process of Pharmacy Students

PART TWO

TEST ITEMS AND DETAILED DESCRIPTIONS FOR EVALUATING MEDICATION-HISTORY INTERVIEWING BY PHARMACY STUDENTS

Relates to

Part One: A Primer of Necessary Skills For Medication-History Interviewing by Pharmacy Students

PART TWO: TEST ITEMS FOR EVALUATING MEDICATION-HISTORY INTERVIEWING BY PHARMACY STUDENTS

Test Items and Detailed Descriptions

Please rank the student with the number that most closely identifies the level of performance achieved by the student during his or her interview. Dichotomous rankings, i.e., yes-no, require only a check mark (X) in the appropriate space. Use the scoring sheet's comment section as liberally as you see fit.

Scoring: 1 = Poor
2 = Needs Improvement
3 = Good
4 = Very Good
5 = Excellent

A. Opening the Interview

1. An opening for an interview includes the following:
   a) An introduction of the interviewer,
   b) Exchange of names,
   c) Explanation of his or her role,
   d) Full description of the interview purpose,
   e) Asking for the patient's reason for the visit, and
   f) Giving an approximate length of time for completing the interview.

   1: The interview lacks coverage of the items above.
   2: Not many of the items above were covered.
   3: The interview opening includes some of the items above.
   4: The opening to the interview includes most of the items above.
   5: The interview includes all of the items above.

2. Height and Weight Characteristics

   The opening should not include specific probes about a patient's physical characteristics, such as height and weight. Background data of this type should be retrieved from other sources or asked later in the interview.

   _____ _____ The interviewer asked for the patient's height and
   No(1) Yes(0) weight during the interview's opening.

B. Nonverbal Behavior: Eye Contact, Facilitation and Mannerisms

1: The interviewer does not maintain eye contact. There is no attempt at facilitative nonverbal behaviors, and the use of distracting mannerisms are readily apparent.
2: The interviewer frequently discontinues eye contact. Missing is a display of facilitative nonverbal behaviors. Some distracting mannerisms are present.
3: The interviewer maintains appropriate eye contact. There is some facilitative nonverbal behavior and distracting mannerisms.
4: The interviewer maintains appropriate eye contact and displays facilitative nonverbal behavior. But there are occasionally distracting mannerisms.
5: The interviewer maintains appropriate eye contact and displays facilitative nonverbal behavior with no distracting mannerisms.

C. Verbal Behavior

1. Open and Closed Questioning

The interviewer starts information gathering with open questions and uses closed (direct or indirect) questions in narrowing pertinent or delicate points that need further elaboration. The interviewer asks a balanced number of open and closed questions in soliciting information.

Starter words or phrases for open questions	Starter words for closed questions
when	is
where	does
how	are
what	can
tell me about	will

Caution: "why" denotes an open question, but its usage may imply a judgment, which is an unwanted result.

1: The interviewer fails to use the questioning skills mentioned above to gather information.
2: The interviewer seldom uses the questioning skills mentioned above to gather information.
3: The interviewer occasionally uses the questioning skills mentioned above to gather information.
4: The interviewer frequently uses the questioning skills mentioned above to gather information.
5: The interviewer almost always uses the questioning skills mentioned above to gather information.

2. Leading or Loaded Questions

Leading questions blatantly or subtly steer patients to the answer interviewers anticipate. Loaded questions contain their own answers, imply judgments, or both.

Examples

Loaded: You've never had gonorrhea, have you?
Isn't it true you are not always a reliable medicine taker?

Leading: Did the chest pain travel down your arm?
Does the medicine make you drowsy?

1: The interviewer asks many leading or loaded questions.
2: The interviewer frequently asks leading or loaded questions.
3: The interviewer occasionally asks leading or loaded questions.
4: The interviewer seldom asks leading or loaded questions.
5: The interviewer asks no leading or loaded questions.

3. Double and Multiple Questions

Double or multiple questions present the patient with two or more inquiries at the same time. They force the patient to decide which inquiry to answer. Multiple questions, whether presented one right after another or successively after each answer, trap the patient in a bombardment of questions and possible answers.

Examples

Double: Are you feeling better now? Do you want your prescription refilled?

Multiple: Are you taking aspirin, vitamins, antacids, laxatives, or using any topical medications?

1: The interviewer asks many double or multiple questions.
2: The interviewer frequently asks double or multiple questions.
3: The interviewer sometimes asks double or multiple questions.
4: The interviewer seldom asks double or multiple questions.
5: The interviewer rarely asks, if any, double or multiple questions.

4. Question Repetition

1: The interviewer asks many repeat and unnecessary questions despite previously receiving the information asked for.
2: The interviewer frequently repeats questions unnecessarily more as a result of duplication than for clarifying or summarizing.
3: The interviewer sometimes repeats questions unnecessarily more as a result of duplication than for clarifying or summarizing.
4: The interviewer seldom repeats questions unnecessarily unless they are for clarification or summarizing information.
5: The interviewer does not unnecessarily repeat questions unless they are for clarification or summarizing information.

5. Jargon and Terminology

1: The interviewer's statements and questions are full or jargon. Explanations are necessary. Pronunciation of key medical and pharmacy terms is poor.
2: The interviewer's statements and questions seldom are free of jargon. Much explanation is necessary. Pronunciation of key medical and pharmacy terms needs improvement.
3: The interviewer sometimes uses medical and pharmacy jargon during the interview. Some explanations are necessary. Pronunciation of key medical and pharmacy terms is good.
4: The interviewer's statements or questions are frequently free of jargon. Few explanations of medical and pharmacy terms are necessary. Pronunciation of key medical and pharmacy terms is very good.
5: The interviewer's statements or questions are free of jargon. Explanations of medical or pharmacy terms are unnecessary. Key medical and pharmacy terms are pronounced correctly.

6. Vocal Qualities

The interviewer enunciates well, articulates well, is audible, uses a variable tone and a moderate tempo, and is understandable.

1: The interviewer fails to display the qualities presented above.
2: The interviewer seldom displays the qualities presented above.
3: The interviewer occasionally displays some of the qualities above.
4: The interviewer frequently displays most of the qualities above.
5: The interviewer consistently displays all of the qualities above.

D. Interviewing Process

1. Flexibility, Logic, and Transitional Phrases

The interviewer is flexible in gathering and dealing with information when it comes at a time or in a sequence that's unexpected and, yet, offers a logical, systematic, and orderly interview process. In progressing from one section or topic to another, the interviewer uses transitional phrases.

In other words, the interviewer views the interview process as providing a function similar to the proper use of questioning skills.

Questioning Skills	Relate to	Interview Process
Open Questions		Flexibility
Closed Questions		Logic
Open-Closed Balance. . . .		Transitional Phrases

1: The interviewer fails to display flexibility, a logical systematic progression, and the use of transitional phrases.
2: The interviewer seldom displays flexibility, a logical systematic progression, and the use of transitional phrases.
3: The interviewer occasionally displays flexibility, a logical systematic progression, and the use of transitional phrases.
4: The interviewer frequently displays flexibility, a logical systematic progression, and the use of transitional phrases.
5: The interviewer consistently displays flexibility, a logical systematic progression, and the use of transitional phrases.

2. Pacing and Flow

1: The interview is done with long pauses or hurried periods that break the continuity of the interview or cause it to be too short.
2: The interview is frequently marked with delays or periods of rushing that break the continuity of the interview.
3: Occasionally, the interview is marked with delays or periods of rushing that temporarily break the continuity of the interview.
4: The interviewer maintains an even pace for the interview, but there are a few delays and hurried periods.
5: The interviewer maintains an even pace for the interview with no delays or periods of rushing.

3. Interruptions

1: The interviewer fails to attend and consistently interrupts the patient's statements without allowing for a complete train of thought.
2: The interviewer seldom attends and frequently interrupts the patient unnecessarily, not allowing the completion of the patient's thoughts.
3: The interviewer attends about half the time, but on occasion interrupts the patient unnecessarily and doesn't allow for the completion of thoughts.
4: The interviewer frequently attends to the responses of the patient and frequently allows sufficient time for complete statements and the answering of questions without undue interruptions.
5: The interviewer attends to the responses of the patient and allows sufficient time for complete statements and the answering of questions without undue interruptions.

4. Clarification and Verification

1: The interviewer makes no attempt at clarifying or verifying patient responses.
2: The interviewer seldom seeks clarification and verification.
3: The interviewer sometimes seeks clarification and verification.
4: The interviewer frequently seeks clarification and verification.
5: The interviewer seeks clarification and verification of the patient's responses during the interview, especially those resulting in drug use or problems.

E. Rapport and Relationships

1. Confidence in Presentation

1: The interviewer fails to display confidence in self.
2: The interviewer seldom displays confidence in self.
3: The interviewer occasionally displays confidence in self.
4: The interviewer frequently displays confidence in self.
5: The interviewer displays a high degree of confidence in self.

2. Reinforcing Cooperation

The interviewer provides the patient with appropriate, but does not overuse, positive reinforcement--some verbal and some nonverbal (e.g., "uh huh," "Go on," "I see," an occasional smile, nodding the head in a positive manner, and praising the patient for proper health-care techniques). One result of overuse is inadvertently communicating (i.e., negatively reinforcing) something not intended: a simple "OK" can indicate a judgment or confuse the patient even if unintended.

1: The interviewer provides the patient with little or no positive nonverbal or verbal reinforcement. Stress is on negative rather than positive, e.g., "I can't believe you have smoked for 20 years before you stopped."
2: The interviewer overuses or seldom uses positive verbal and nonverbal reinforcement.
3: The interviewer sometimes provides the patient with appropriate verbal and nonverbal positive reinforcement. But the interviewer begins to use them too frequently.
4: The interviewer frequently provides the patient with appropriate verbal and nonverbal positive reinforcement.
5: The interviewer provides the patient with appropriate verbal and nonverbal positive reinforcement.

3. Responses to Patient Problems and Concerns

Professionalism defined in this context requires a balance between passive and active participation on the part of the interviewer. A lack of professionalism is either being too passive or being so active such that the interviewer shows no regard for the roles of other health-care team members, especially the patient's physician. Examples of an active, passive, and overly active approach are shown below.

Active: I'll be sure to mention that problem to your doctor.
Passive: You be sure to bring that up to your doctor.
Overly Active: You are experiencing leg cramps? That's due to a decreased potassium level. You should be taking a potassium supplement.

1: The interviewer does not take an appropriate professional role in discussing the patient's problems and concerns.
2: The interviewer seldom takes an appropriate professional role in discussing the patient's problems and concerns.
3: The interviewer occasionally takes an appropriate professional role in discussing the patient's problems and concerns.
4: The interviewer frequently takes an appropriate professional role in discussing the patient's problems and concerns.
5: The interviewer takes an appropriate professional role in discussing the patient's problems and concerns.

4. General Attitude Toward Patient

The interviewer respects the patient and his or her concerns. The interviewer is attentive to the patient's ideas, thoughts, and questions. The interview focuses on the patient's thoughts, answers, and ideas, not the interviewer's.

1: The interviewer shows no respect for the patient and his or her concerns. The focus is on the interviewer, not on the patient.
2: The interviewer seldom shows respect for the patient and his or her concerns. The focus begins to be more on the interviewer than the patient.

3: The interviewer occasionally shows respect for the patient and his or her concerns.
4: The interviewer usually shows respect for the patient and his or her concerns.
5: The interviewer actively shows respect for the patient and his or her concerns.

F. Closure

1. Summarization

1: The interviewer fails to summarize with the patient the pertinent target drug information.
2: The interviewer seldom summarizes with the patient the pertinent target drug information.
3: The interviewer partially summarizes with the patient the pertinent target drug information.
4: The interviewer frequently summarizes with the patient the pertinent target drug information.
5: The interviewer summarizes with the patient the pertinent target drug information.

2. Feedback, Further Questions, and Good-bye

The interviewer provides the patient with an adequate opportunity to discuss additional points or ask additional questions and encourages the patient to do so. Also, the interviewer states where to direct future questions, and cordial good-byes are exchanged.

1: The interview has none of the points above.
2: The interview is missing most of the points above.
3: The interview includes some of the points above.
4: The interview includes most of the points above.
5: The interview includes all of the points above.

G. Overall Thoughts About Interview

1. Overall, I would rate this interview as

1 2 3 4 5

2. Overall, the interviewer's <u>control</u> of visible "nervousness" was

1 2 3 4 5

3. Overall, the interviewer's person-oriented approach (as opposed to a task-oriented approach) was

1 2 3 4 5

APPENDIX J

Estimated Maximum Completeness Score for the Medication History Used in This Study

This completed interviewing content evaluation form illustrates the items that would be checked if the student gathered all of the information scorable on Okubo's (1986) form about the specific medication history used in this study. It should be noted, however, that not all of the information from the scripted history (Appendix F) can be scored on Okubo's form, such as the patient's use of table salt and cigarettes.

IV. INTERVIEW CONTENT EVALUATION FORM

Interviewer Code _____ Videotape Number _____ Interview Number _____:_____

Reviewer's Name _____ Reviewer Code _____ Date of Review ___/___/___
Mo. Day Year

	A	B	C	D	E
CURRENT PRESCRIPTION MEDICATIONS (ASD ✓)					
Name of medication	✓	—	—	—	—
Dose or strength	✓	—	—	—	—
Schedule (tid, qd...etc., -or- prn)	✓	—	—	—	—
Actual vs. Prescribed use	✓	—	—	—	—
Gathers data describing course of therapy	✓	—	—	—	—
Reason for use	✓	—	—	—	—
Effectiveness as stated by patient	✓	—	—	—	—
Assesses S.E. and/or adverse rxns	✓	—	—	—	—
CURRENT NONPRESCRIPTION MEDICATIONS (ASD ✓)					
Name of medication	✓	✓	—	—	—
Dose or strength	✓	✓	—	—	—
Schedule (tid, qd...etc, -or- prn)	✓	✓	—	—	—
Assesses S.E. and/or adverse rxns	✓	✓	—	—	—
Gathers data describing course of therapy	✓	✓	—	—	—
PAST PRESCRIPTION/NONPRESCRIPTION (ASD ✓)					
Name of medication	—	—	—	—	—
Why medication was stopped	—	—	—	—	—
Reason for use	—	—	—	—	—
Dose or strength	—	—	—	—	—
Schedule	—	—	—	—	—
S.E. PAST MEDICATIONS (ASD ✓)					
Name of medication	—	—	—	—	—
Dose or strength	—	—	—	—	—
Description of side effect	—	—	—	—	—
ALLERGIES PAST MEDICATIONS (ASD ✓)					
Name of medication	✓	—	—	—	—
Description of reaction	✓	—	—	—	—
Determines if patient was rechallenged	✓	—	—	—	—
Determines actions taken	✓	—	—	—	—

COMMENTS
A= Hydrochlorothiazide

(A) = Aspirin
(B) = Vitamin

allergy to penicillin..... (Yes) No
allergy to Sulfas..... Yes No
allergy to Iodine..... Yes No
allergy to Vaccines..... Yes No

The interviewer determines whether the patient has any difficulty taking the drug (for example, difficulty remembering, missing doses)..... (Yes) No
The interviewer determines whether the patient has any concerns or problems with the drug(s)..... (Yes) No
The interviewer gives incorrect information..... Yes No

Comments: _____

APPENDIX K

Subscores for the Skill and Completeness Measures

Subscores for the Measure of Interview Completeness[a] (n = 112)

Category	No. of Items	Mean ± S.D.	Range
Current prescription medications	9	6.304 ± 1.593	1-9
Current nonprescription medications	11	3.321 ± 1.453	0-8
Past prescription and nonprescription medications	1	0.563 ± 0.516	0-2
Side effects from past medications	1	0.018 ± 0.189	0-2
Allergies to past medications	5	2.813 ± 1.597	0-5
Miscellaneous			
Penicillin allergy[b]	1	0.829 ± 0.378	0-1
Problem detection[c]	2	1.556 ± 0.585	0-2
ASQ score[d]	5	2.946 ± 1.138	0-5

[a]All items were evaluated as 0 for no, 1 for yes.

[b]Only one student specifically asked about any of the other three drug allergies listed on the form (the student asked about sulfa allergy).

[c]This includes the two items relating to asking the patient about difficulties taking the drug or about any concerns or problems.

[d]This is the composite score for the five "asked screening question" items; these items are also recorded in the appropriate category subscores.

Subscores for the Measure of Interview Skill[a] ($\underline{n}$ = 112)

Category	No. of Items	Mean ± S.D.	Range
Opening	2	...[b]	1-6
Nonverbal behavior	1	3.688 ± 1.023	1-5
Verbal behavior	6	23.804 ± 3.698	10-29
Interviewing process	4	14.107 ± 3.189	4-20
Rapport and relationship	4	13.420 ± 3.641	4-20
Closure	2	5.607 ± 2.346	2-10
Overalls	3	9.661 ± 2.843	3-15

[a]Subscores are reported for the six categories of items included in the interview skill variable and for the overalls category. Subscores were computed as the sum of the student's scores for all items in the category. For all items except item 2 (in the opening category), the items were evaluated on a scale of 1 (poor) to 5 (excellent).

[b]A mean subscore was not computed for this category since item 1 was evaluated on the five-point scale and item 2 as a dichotomous variable (0 for no, 1 for yes). The mean values for items 1 and 2 were 3.652 ± 0.946 and 0.938 ± 0.243, respectively.