AN ANALYSIS OF THE EFFECTS OF USING DIRECT MEASURES IN A COMPETENCY BASED PROFESSIONAL EDUCATION PROGRAM: AN EXAMPLE IN NURSING

by

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Dedication

This work could not have proceeded without the dedicated commitment of many people. That commitment went beyond task orientation and this became a work of love--to try out a different way of learning, and to share that try with others.

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I feel joy, gratitude, and love.

D. Dean
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CHAPTER I

INTRODUCTION

The purpose of this study is to demonstrate the serial relationship between behavioral criteria (competencies) and the measured evidence of the application of the competencies by the learner. Specifically, our task is twofold: 1) to describe the development of a competency based educational program; and 2) to measure the application of those competencies by the learner in clinical field settings. The specified competencies are select behaviors from a nursing curriculum. This study concentrates on the educational process and the application of specified behavior during the learning period. No attempt is made to examine the relative merits of the select behaviors or to measure the effects of the application of nurse behavior on changes in patient health status.

The author starts with the basic assumptions that: 1) education (learning) is a developing science; 2) special education contributes substantially to the development of educational technology; 3) professional education shares some common concerns with special education, and 4) the educational process for nursing education has the same attributes as education in general.

At no time in the history of education have we had more scientific knowledge and technology at our disposal than now. Some of the most exciting discoveries about human behavior are for the first time coming from schools of education and from those working in the area of human

development and learning (Lindsley, 1972; Patterson, 1969; Ullman and Krasner, 1965; Vargus, 1972).

The beginnings of the science of learning relevant to this study were with the early laboratory work in psychology. The work of Thorndike, Hull, Watson, and Pavlov gave rise to the development of two distinct approaches to the understanding of human behavior. The classical conditioning model is the model of contemporary behavior therapists. The operant conditioning model is the model of contemporary learning theory, behavior modification, programmed instruction, and precise behavioral management (Franks, 1969).

Beginning with our knowledge of animal learning and continuing with our knowledge of human learning, lawful relationships concerning the conditions of learning have emerged (Skinner, 1938; Ferster and Skinner, 1938; Lindsley, 1954, 1956). These lawful relationships are assumed to be content free. The scientific study of human behavior has enabled us to specify, analyze, synthesize, program, teach, remediate, and discover new relationships (using a research paradigm). This study demonstrates the use of a beginning approach to education as a science with predictive tools and with replicability. We wish to support the notion that education as a science can directly benefit the learner and can specify educational products as a result of an educational program.

Special education is applied behavioral science. The special educator's area of primary concern is educational deviance. This concern emerges across specific deviances, behavior problems, and academic subject areas. Special educators are among those pioneering the development of a science and technology of education. From this development, specification,

programming, teaching and remediation have been applied for and with the educationally deviant and their families. There has been notable improvement in the life-style of persons with deviancies by teaching those heretofore thought unteachable (Haughton, 1972; Slezak, 1969; Waechter, 1970; Walker, 1969).

Deviant behavior has been conceptualized and brought under the control of stimulus and consequent events in both the internal and external environments of the behaver (Walker, 1969; Sokolov, 1973). If we accept that lawful relationships of behavior are content free, we can further generalize that deviant as well as non-deviant behavior can come under the same lawful control. Therefore, we can begin to conceptualize the educational process in the same way that we have conceptualized the learning of the educationally deviant (Leonard, 1968; Walker, 1971). This implies that we specify, analyze, synthesize, program, teach, remediate, and discover new relationships in the education of both the deviant and non-deviant.

As primary consumers of the technology of education to improve the educational process for the deviant, special education has further developed more general concerns for the education and training of the professional educator. We believe we are at an advantage (compared to other areas of education) in that the behavioral outcomes are of necessity highly specific for learners in special education programs. Therefore, the entire gamut of the science and technology of education are generally applicable by special educators. There is further realization of the human service orientation of education. This orientation has been most often discussed as the future professional's responsibility

to his client and for the outcomes of the professional-client relationship. Education then, can be defined as a developing science which has as a major concern a human service orientation to its first level consumer - the learner.

Professional education programs in the behavioral sciences are generally human service oriented. A human service orientation implies responsibility for other humans in a caring manner that takes into account the consequences to the recipient of the service rendered by the professional. Professional educators have made distinctions between education and training. Generally, education has come to mean cognitive, conceptual, and scientific. Training, then, deals with application components and takes into account practicum and field placement expectations. To this author, the separation seems but heuristic, and for the purposes of this study, we will not differentiate education and training.

It appears that the same degree of technology has not been exercised in higher education as has been exercised with the educationally deviant. Although there have been notable exceptions cited in studies on the use of programmed instruction and contingency contracting, we have not approached the learner in professional education as if his learning comes under the same lawful control as the behavior of those to whom his services are directed (Loeb, 1971; Holland and Skinner, 1961; Homme, 1969).

The use of behavioral objectives enables us to utilize programmed instruction and contingency contracting in more creative ways (Saslow, 1971). It seems that a most crucial step for professional education is to measure classroom, laboratory, and seminar outcomes as applied in practicum and field settings.

In this study, the tools and technology developed and tested in work with educationally deviant children was used in the development of a curriculum for professional education in nursing. The professional education of nurses has the same process concerns as any professional education program. Nurse is defined as a person applying a specified set of behaviors in specified environments with the goal of making the recipient of said behavior (patient) change in the desired direction (better health). A curriculum was designed to produce a particular and select set of learner behavior which would contribute to a final product - nurse performance.

A nursing curriculum provides an example of a goal oriented curriculum where it is deemed crucial to specify the behavior of its products (the learner), as the consequences to the consumer (employer and patient) are immediate and serious (often grave) if that product is incompetent.

Precise Behavioral Management is the system used in the development of the nursing curriculum and in this study. This system was developed by Ogden R. Lindsley with direct feedback from 16,000 teachers, peers, and students (Lindsley, 1970; Koening, 1971). Precise Behavioral Management has been established as an aid in predicting human behavior (Lindsley, 1972; Koenig, 1972; Waechter, 1972; White, 1971).

The Daily Behavior Chart is currently used with thousands of behaviors to describe, measure, and predict individual human frequencies and celerations. The system protects each person as unique at the same time that it allows for individualized instruction, and learner, curriculum, and administrative decision making.

The nursing curriculum used was implemented in a small Oregon community college. It was designed as a career ladder to develop three levels of nursing: 1) nursing assistant; 2) practical nurse; and 3) associate degree nurse (R.N.). These levels are nested so that each succeeding level contains expectation of knowledge from preceding levels. (See Appendix A).

For the purposes of this study, we have focused on the most immediate consumer in the educational process, the learner. The curriculum was developed to clearly specify what behavior the student would acquire as a result of passing through a series of nursing courses. Behaviors were specified as course outcomes. (See Appendix B). Each behavior was specified as was the accuracy and frequency expectations. Whenever the learner demonstrated that he had reached the stated proficiencies, then he was deemed competent to perform that behavior in a clinical field placement.

Of central concern with any educational program is the problem of understanding the relationship between what is learned by the student and what is subsequently used. Competency was determined by the student, using the daily behavior chart to keep a daily record of competencies as used in the clinical settings. Validity and reliability checks were done by faculty to facilitate a reliable and valid daily record. These records were examined in-line and were stored, summarized, and analyzed by cumputer to facilitate decision making at the student, curriculum, and administrative levels.

In summary, we have viewed education as a developing science which has as its task improving the behavior of the learner as well as developing

education as a viable way of improving the human condition. The goal of education as used here is to change behavior. That being the case we must have some way to: 1) determine which of a wide range of behaviors needs to be changed, learned, or improved; 2) precisely measure the existence of those behaviors in the actual behavioral repertoire of the learner; and 3) determine the direction, frequency, accuracy, and effects over time of those behaviors.

We have attempted to establish that it is possible to pinpoint educational criteria in every domain, measure its existence in the behavior of the learner, and predict outcomes, and that we can be accountable for the products of the educational process. Accountability implies educational and economic responsibility for the educational process itself.

CHAPTER II

SELECTED REVIEW OF THE LITERATURE

Since the literature dealing with education is voluminous and not necessarily relevant to the concerns of this study, this review will direct itslef toward the specific issues described in the study. These are: 1) discussions related to competency based education, and specifically, the literature dealing with articulating educational objectives; 2) the measurement of those objectives in education; and 3) the correspondence between the acquisition of specific competencies in the classroom and their application in practice.

Contemporary education appears to have operationalized two distinct educational strategies in response to the development of behavioral technology. Simply stated, one involves the specification of educational objectives (Mager, 1962, 1972; Bloom, Hastings, and Madaus, 1971; Burns, 1972), and the other involves the employment of a more experimental analysis approach (Ferster, 1968; Keller, 1967a, b; Kent, 1965; Lloyd and Knutzen, 1969; and Malott, 1968). The latter approach employs the specification of behaviors and programs these behaviors in such a way that the acquisition of one component is requisite for the next as in programmed instruction. Additionally, these efforts involve the manipulation of contingencies to ensure the acquisition of criterion performance specified by the program (Young and Van Mondfrans, 1972). Sheppard and McDermott (1970) have demonstrated that differential exit points can be specified by assigning grades for different levels of number of skills acquired.

Skill acquisition for programs such as these have invariant criteria and the learner either demonstrates competence with the skill or fails to meet criterion. Acquisition of these behaviors are assessed almost without exception by pencil-paper tasks with no attempts to measure the correspondence of these competencies with their application in applied settings.

The more widely used educational strategy employs the preparation of educational environments that attend to: 1) What is it that we must teach? 2) How do we know when we have taught it? and 3) What materials and procedures will work best to teach what we wish to teach? (Mager, 1972; Andrews, 1972). The function of this process is as Bloom states, "the act of breaking a subject and a set of behavioral objectives into a series of tasks and activities" (p. 13). He further suggests that if this is done properly, it will result in the learners developing cognitive and affective characteristics which are intended educational outcomes (Bloom, Hastings, and Madeus, 1971). The basis for this process as Bloom (1956) views it is the development of a complete taxonomy of objectives. He asserts that there is a logical flow in the development of knowledge for the learner. From this logical flow, he has developed domains of learning, and these domains of learning can be evaluated from teacher developed tests. It appears that the educational environments stipulated the parameters for evaluation. The educational environment for Bloom was essentially the classroom. The correspondence of educational objectives for the clinical or field settings was not dealt with. Vargus (1972) has further refined Bloom's taxonomy from a behavioral point of view. She has taken Bloom's domains of learning and has demonstrated that these domains are inferred from the presence or absence of certain

behaviors. This can be illustrated with the example of "an understanding of the principles of . . ." infers that the learner can demonstrate the presence of overt behaviors that relate to the principle. She suggests that a straightforward approach would be to describe the behaviors directly rather than to deal in inferences. However, her analysis does not extend to the affective domain, but is restricted to those behaviors that can be observed by another individual. Twelker (1969) has additionally developed a classification system similar to Bloom's, but has included a psychomotor domain. The psychomotor functions include skill acquisition. Saslow (1972) has added a domain which they call interrogative.

Efforts in both these directions, the experimental analysis, and the more widely used establishment of behavioral objectives, have lead to the use of "tests" as measures of intended outcomes. A search of the literature does not provide a body of information that relates to the correspondence of behavioral outcomes and their intended use. The literature directs itself primarily to score changes on tests measuring the acquisition of behaviors in more restricted environments. Baker (1969) has provided one attempt in examining the correspondence of acquired behaviors and their occurrence in vivo. Her investigation describes the effects and changes in teacher behavior, i.e., the delivery of instruction, when teachers were provided instruction on how to operate a classroom based on learning principles. Data were collected on the use of those learning principles when the teacher was in the classroom. Independent observers were used who recorded the occurrence of five different response classes related to training. The major difficulty presents itself with their recording protocol in that observers had to

make some judgment of the intended purpose of the behaver. The results, while showing that there was in fact a correspondence, are substantially weakened because of the absence of using a direct measure.

Development of Precise Behavior Management (Lindsley, 1964) has provided tools and a methodology that incorporates and extends the desirable outcomes of the previously discussed educational strategy. Simply, Precise Behavior Management provides for: 1) precise definitions of behavior, i.e., pinpointing; 2) measurement and analysis procedures that provide for a direct and daily measure of learner performance; and 3) a language system that allows both a descriptive and functional analysis of environmental conditions. The efficacy of this strategy has been amply demonstrated (Lindsley, 1970; Caldwell, 1966; Johnson, 1971; Haughton, 1968, 1972; Koenig, 1967, 1972; Waechter, 1970, 1972).

CHAPTER III

METHOD

The purpose of this study is to demonstrate that: 1) a nursing curriculum can be specified in terms of behavioral outcomes; and 2) that these outcomes or competencies once acquired by the learner (i.e., student nurse) are used in clinical field settings. As the review of the literature has suggested, there have been ample demonstrations that the traditional didactic experience offered by professional training programs can specify the content of a course in terms of objectives. However, as the review also has pointed out, these objective outcomes are measured not in terms of the substantive content in relation to practical application, but rather by pencil-paper tasks.

Defining behavioral objectives has two major advantages in providing educational opportunity. First, it allows a straightforward analysis of educational intent, and secondly, reduces superstitions about the relationship of educational content to its ultimate use.

This study was conducted at an Oregon Community College. The demands of this program are typical of any nursing program; that is, the availability of a course of study which results in the acquisition of a nursing degree. A curriculum was developed to achieve consistency between program objectives and those behaviors that are necessary for an individual to perform as a nurse. For the purposes of this study, we will differentiate between two types of response classes. These

types are differentiated as a function of stimulus conditions and not behaviors; that is, the behaviors acquired in a course of study are the same as those used in clinical settings. However, for the clarity of discussion, we will describe those behaviors acquired and demonstrated in the course or laboratory as course behaviors (see Appendix B), and those demonstrated in the clinical setting as program product behaviors (see Appendix C).

The curriculum is designed in such a way as to be a self-pacing career ladder which prepares the learner for three levels of participation in the science of nursing. These three levels are: 1) nurse's assistant; 2) practical nurse; and 3) registered nurse. These courses are outlined by term and description in Appendix A. These courses reflect a content which should provide the learner with a sound basis for the conceptual development of nursing as an applied science. The courses provide for the acquisition of skills that range from basic skills such as taking temperature, to those skills in the affective domain, requiring interpersonal demonstration of a sensitive caring relationship with the patient.

These product behaviors can be grouped into five general response classes:

1) Interpersonal relations
2) The application of nursing skills
3) The application of scientific concepts
4) Patient teaching
5) Giving personalized nursing care

There were 30 learners in this project. The age range was 18 to 56 years of age, with a median of 25. There were eight minority students, nine men, and thirteen women who did not identify with any minority group. The education ranged from general education exams for high school equivalency to baccalaureate degree in fields other than nursing. The median education was one year of post secondary education. While this program had a higher proportion of minority and men learners than other nursing programs in Oregon, these learners were typical of community college nursing students in Oregon.

The nursing curriculum was designed to follow from the faculty's assumptions regarding learning and the learner, and consistent with the philosophy of the community college. The eight primary assumptions were:

1) A moral and ethical responsibility to produce a nurse competent, upon graduation, to perform at a specified level;
2) The learning atmosphere should de-emphasize failure;
3) The learning atmosphere should maximize success;
4) Decisions about the learner's progress should at all times be jointly made between faculty, learner, and the learner's peers, unless the learner requests not to have peers present;
5) Decision making is maximized with data;
6) Learners can keep data on their own performance;
7) Faculty should keep data on faculty performance related to learner outcomes; and
8) That faculty development is a necessary and ongoing aspect of the learning environment.

It was decided that all learners should be able to self pace through a given set of competencies. In this respect, all learners would be alike in their competencies. Further, all learners would be stimulated and consequated for developing competencies in areas of their own choosing. In this respect, all learners would be unique in their competencies.

With the above assumptions in mind, an examination of various curriculum models ensued. A combination of the "spiral" and "upside down" models was selected. This would give the learner a mix of general education and clinical nursing courses from the beginning and throughout each level of the approximately two years of the program.

There was an effort to select a general education mix that would facilitate learning nursing as an applied science. The scientific model as a concept was introduced to learners at the beginning of their course work.

There is a fairly well agreed upon body of knowledge and skills that is considered to be basic nursing. This body of knowledge and these skills have not been clearly demonstrated as to their use and/or their effectiveness as it relates to goal attainment. A thorough search of the nursing literature revealed a paucity of information regarding the actual observed performance of nurses in clinical and/or laboratory settings (Dean, 1968). Most studies used opinion and attitude scales and check lists.

There were limitations as to time and resources; therefore, an empirical study was limited to an opinion survey using the same techniques as others. We interviewed individuals and groups, and asked two questions: 1) What are the behaviors of a competent nurse? and 2) How accurately

should those behaviors be performed and at what speed? Those interviewed were 1) nurses; 2) student nurses; 3) faculty in other programs, 4) nursing administrators; 5) hospital administrators; 6) physicians; and 7) our college administrators and faculty. Students from other nursing programs were also asked to rank and share three weaknesses and three strengths of their programs, and to suggest the things they would like to see in a nursing program.

Few of the respondents' comments related to acquisition or presence of motor skills. The presence of motor skills was apparently perceived as a given. An example response was "she should know how to do what is ordered but the most important is that she be considerate and a good listener". The majority of responses related to the affective and interactional domains. Example responses are: 1) "A nurse should be a kind person"; 2) "Sensitive to the needs of others"; 3) "Understanding".

It seemed clear that the affective and interactional domains were important areas in which to define and measure competencies.

Information from the literature, the interviews, and from the skills and resources of the faculty were utilized to generate competencies. The behaviors identified, for which competence would be established, were from the cognitive, affective, and psychomotor domains. For the purposes of this study, we include interactional domain as a subset of affective.

Once nurse behaviors were generated, they were put on cards, one behavior to a card. Various arrangements of cards gave alternative course arrangements. The course arrangement decided upon is seen in

Appendix A. Examples of behaviors of which a course consists are in Appendix C.

The determination of expected frequency was a difficult task in that attempts to observe the frequency of selected behaviors of practicing nurses were aborted. Student and faculty observation of nurses received comments and concern that nurses might be judged as to the quality and accuracy of nurse behavior under adverse circumstances and that this information might result in a nurse being ranked or rated as giving poor, rather than good quality, care. The faculty decided that under those circumstances and the possible consequence of adverse public relations for a new and different program that direct observation should be done under more carefully controlled and defined conditions. Therefore, the expected frequencies were more arbitrarily set as being defined from observation of faculty performance of expected behaviors and cursory information from practicing nurses. Accuracy for behaviors was set to be error free for psychomotor skills, and no more than one to two errors for cognitive skills. There were no frequency and accuracy criteria set for feelings counted.

The use of the word "error" lead to more emphasis on errors than desired in clinical settings. A response class called learning opportunity was used to include three types of responses: 1) errors; 2) errors self corrected; and 3) opportunities seen to learn new and/or different material related to a current learning task or situation. Therefore, we generally did not have a daily record of errors alone. If for some specified reason a learner, faculty, or field person wished to examine errors, a record would be kept relevant to the issue of

concern. The response classes "correct" and "learning opportunity" are used for each behavior and constitute what is called an "accuracy pair".

The environment of the acquisition of competencies is set up in the following sequence:

1. Course behaviors are identified, i.e., takes temperature, reads thermometer, correct and learning opportunity.
2. Frequency criteria are set, i.e., takes temperature correct x2 in ten minutes and x0 in ten minutes learning opportunity, reads thermometer correct x40 in two minutes and x0 in two minutes learning opportunity.
3. Conceptual information is identified for each skill. Conceptual information is in a write or say format, and has expectations as to frequency and accuracy criteria, i.e., in five minutes list the four most important concepts in the taking of body temperature. Name at least two nursing actions (behaviors) that would follow from an understanding of each.
4. The learner would then pass through a series of conceptual (cognitive) exercises regarding the skill he was about to demonstrate. These exercises were to be written and/or said. The learner could continue with each exercise until he reached frequency and accuracy expectations. When these expectations were met, the learner was considered competent in the cognitive area.
5. Competence in the cognitive area of each skill was consequated by going to the next step: demonstration of the psychomotor skill associated with the cognitive exercises.

6. Demonstration of the psychomotor skill was accomplished in a simulated patient care situation in the nursing laboratory on campus. The skill demonstration was timed. The criteria for correctness of the skills was "concepts used correctly" and "concepts violated". Skills were to be done with no violation of concepts. This raises the question as to whether there is a right way or a wrong way to do a skill. The obvious decision was to allow creativity as long as the terminal behavior was executed and no scientific concepts were violated. This was an application of a suggestion from B.F. Skinner's work with animals: Specify the behavioral outcome, leave the form up to the behaver (Skinner, 1938). When frequency and accuracy expectations were met the learner was considered competent in the psychomotor skill.
7. Competence in the psychomotor skill itself was consequated by going to the next step: application of the skill in the care of patients in a clinical field setting.

Students could move through these steps at their own pace. Each behavior has cognitive and skill components.

The application of behaviors in which the student had acquired competence required an inquiry into the nature of the response classes previously mentioned. These classes do not specify the application of each specific behavior (i.e., "takes temperature", "asks open-ended questions") but specifies the application of the class of behaviors (i.e., "uses skills correctly", "uses skills learning opportunity"). Learning opportunity is also the previously described use of a class

of responses. These classes of responses have emerged as program product behaviors. (See Appendix C). They are recorded daily from the day of entry to the day of exit in the program. They are recorded continuously during the time planned for the behavior to occur. However, most learners recorded the behaviors over the time possible for the behavior to occur. This was a learner choice.

Faculty did reliability checks by selecting a time sample to observe learner performance. During the time sample, the instructor counted the same behavior as the learner. At the end of the sample the learner and the instructor compared counts. These checks were also used as instructional opportunities.

The total number of skills in any response class at any given time varied from learner to learner since each learner self-paced. Therefore, a learner could from the day of entry into the program use one or more skills in a clinical setting. This specification of behavior allows the learner and the instructor to communicate to responsible persons in the clinical settings exactly what can be expected of the learner at any given time. It not only allows but recognizes the uniqueness of each learner.

Changes in frequency and celeration of program product behaviors facilitated a better understanding of the effectiveness of each instructor, specific courses, and field placements.

As has been adequately pointed out in the review of the literature, evaluation of outcomes is not only necessary as an educational process, but more importantly for the purposes of this study, the demonstration that acquired competencies are used in clinical settings is also important.

Since it has been adequately demonstrated that there are day to day differences in the performance of individuals, there are a number of measurement prerequisites that are necessary. One is that a measure be selected that has potential for variance; secondly, that it can be measured reliably and easily through non-independent observation schemes. Fortunately, in this particular set of circumstances, measurement becomes a reasonably straightforward process by which we can record the occurrence of the five accuracy pairs previously described. There are a number of ways in which the occurrence of behavior can be treated as a measure. However, it has been common practice since Skinner (1938) and Ferster and Skinner (1957) outlined the systematic use of rate of responding as a universal datum to measure human behavior that the occurrence of a behavior is divided by the amount of time that the behavior was recorded, producing a frequency which provides a sensitive measure to examine change (Lindsley, 1956). Koenig (1972) has shown that frequency as a measure is applicable to all of human behavior. As he has suggested, the word behavior implies movement or motion, and that all movements have duration. Since movement and duration are sufficient to produce frequency, he concludes that frequency is something that all behaviors have in common.

For the purposes of this study, then, frequency will be used as the measure determining the occurrence of acquired competencies in clinical settings. Additionally, in order to examine day to day variance, behaviors were recorded daily and charted on the Standard Behavior Chart. The Standard Behavior Chart is a semi-log, 6-cycle chart developed by Lindsley (1964) and has wide application and is central to precise behavior management strategy.

Analysis of Data

While there are two issues addressed in this thesis, only one, i.e., performance measures of learner competency in a clinical setting, involves the presentation and analysis of data. For the purposes of this study, the data were analyzed to demonstrate that performance did occur in the clinical setting and that these performances additionally have programmatic relevance. The basic intention of this study was to examine behavioral process as opposed to behavioral outcome. This committment presents some problems in summarizing the unique performance characteristics of 30 learners. For this reason, group or summarized data were supplemented by sample individual learner performance data which are used to collaborate inferences drawn from summarized performance.

The data are presented in three fashions:

1) Individual records consisting of day to day frequencies charted on the Standard Behavior Chart. Individual charts were used to demonstrate the correspondence between "applies nursing skills" and "applies nursing concepts", and to illustrate the best, middle, and poorest learners in the program. These learners were selected on the basis of teacher judgment.
2) A log-log (6 x 6) scattergram provides a visual description of the correspondence of frequencies for two different responses, i.e., "applies nursing skills" and "applies nursing concepts". Additionally, a phi correlation coefficient was computed.
3) Celeration analyses were made for each individual and summarized. The summary shows the range of performance, the number of

program interventions, and the celeration for each learner. Because of the restricted use of celeration analysis, the following is a summary describing this statistic and its use in this study. Celeration is a general term for describing overall performance change, both accelaration and decelaration. A procedure developed by Lindsley and Koenig (1972) called the "quarter intersect" technique produces a straight line representing the general linearity of the data. The basis for this procedure is to construct a straight line so that the variance of the data around that line is equal. Koenig (1972) has shown that this procedure produces a line bisecting the total variance more efficiently than least-square regression analysis. Utilizing this best fit on the semi-log Standard Behavior Chart has been additionally shown to have predictive validity (White, 1971). For the purposes of this study, all celeration lines for each learner are shown in one figure, allowing examination of the range of performance, absolute frequency, and the proportion of those accelerating or decelerating.

RESULTS

The intention of this study was to describe not only the occurrence but the programmatic relevance of five classes of response pairs. The five classes of response pairs were:

1) Applies nursing skills correctly
   Applies nursing skills learning opportunity

2) Applies nursing concepts correctly
   Applies nursing concepts learning opportunity

3) Personalizes patient care
   Depersonalizes patient care

4) Teaches patient correctly
   Teaches patience learning opportunity

5) Interacts positively
   Interacts negatively

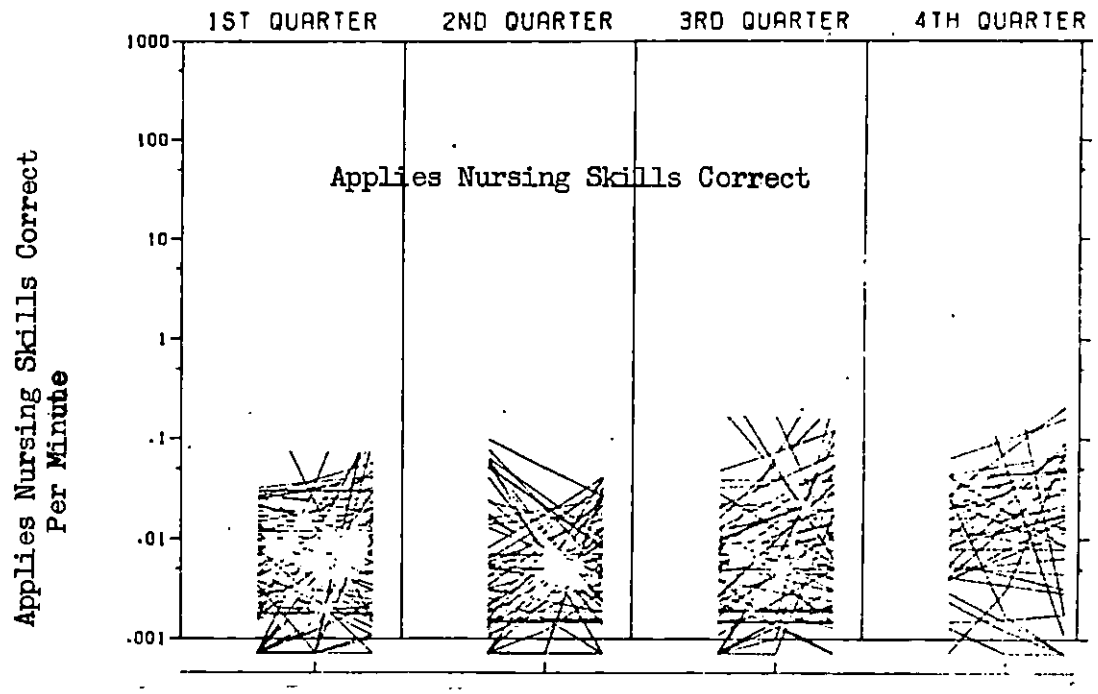
Examination of Figure 1 clearly demonstrates that the traditional substantive concerns of nursing, i.e., nursing skills, occur in the clinical setting. Figure 1 shows celeration for 30 learners over a four academic quarter period (See Figure 1).

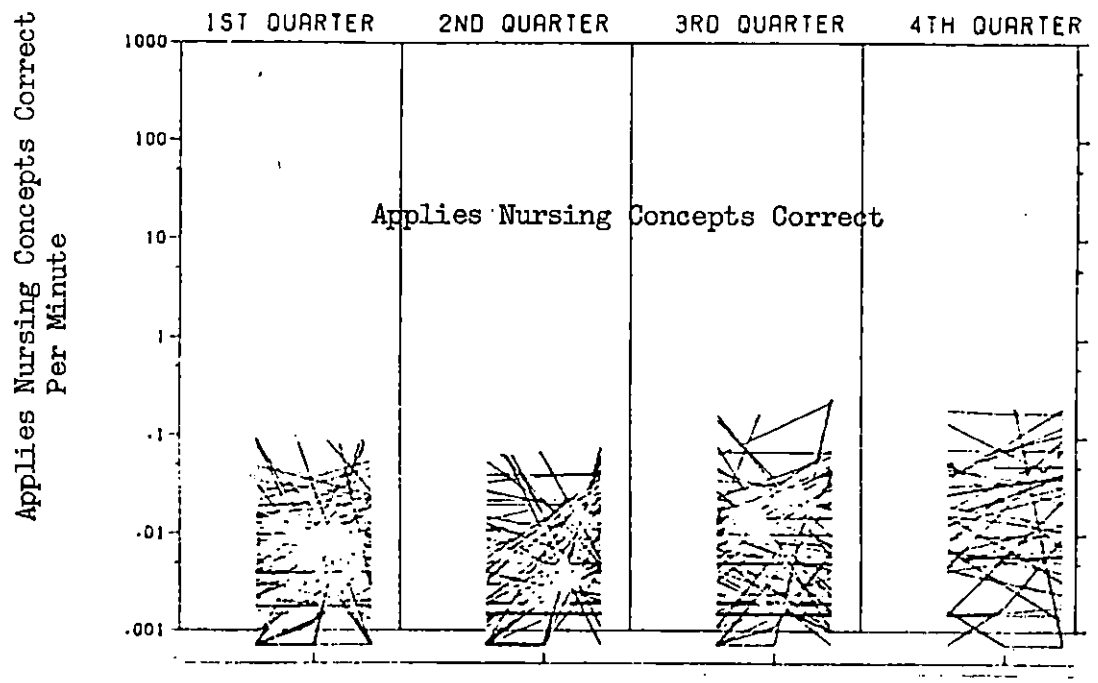
Similar finding can be seen if one examines "applies nursing concepts correctly". The performance characteristics illustrated in Figure 1 indicates a range of application of skill and/or concept from once a day to once every five minutes, with a median for the first two quarters of about once every 100 minutes, and about three times every 100 minutes for the third and fourth quarters.

Examination of Figure 2 provides a descriptive statement of the group summary on learning opportunities for both skills and concepts (see Figure 2). As in Figure 1, the overall topography of these figures is similar, with the notable exception of the narrow range of relative

FIGURE 1

FREQUENCY AND CELERATION SUMMARY OF
APPLIES NURSING SKILLS AND CONCEPTS CORRECT
FOR THIRTY STUDENT NURSES OVER FOUR ACADEMIC QUARTERS



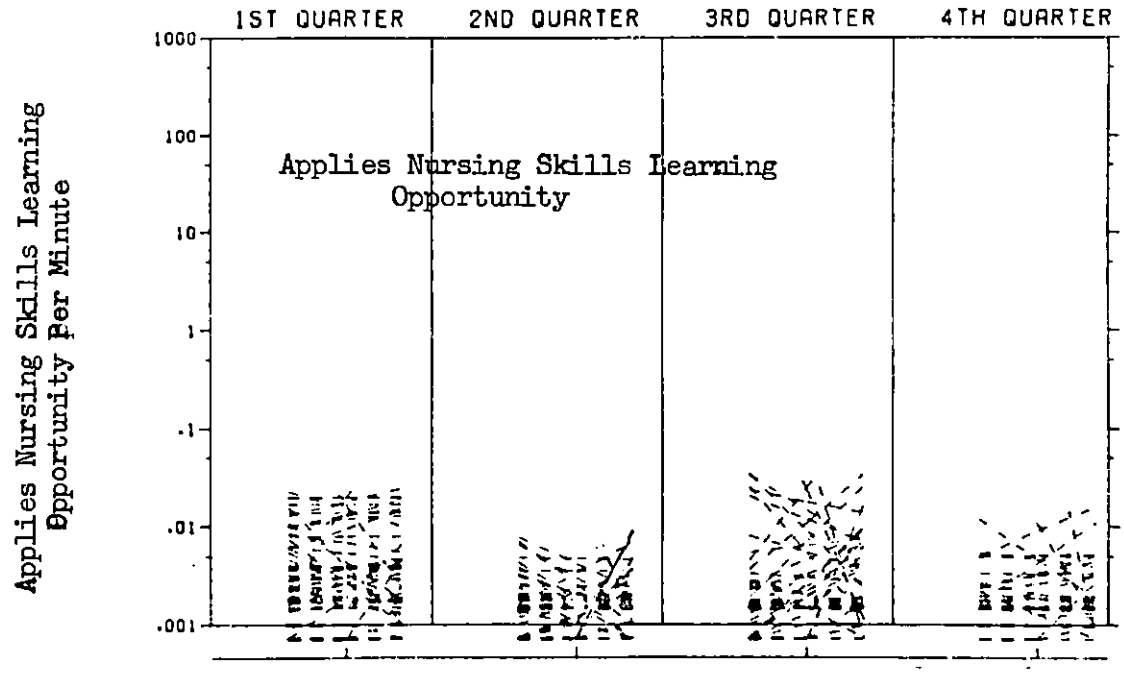


frequency. Of programmatic relevance for Figures 1 and 2 is the correspondence or relationship of the two response classes. Not only has there been a demonstration that skills taught in an academic setting are applied in clinical settings, but that there is a strong relationship between the cognitive aspects of the nursing program, i.e., application of nursing concepts, and the psychomotor functions of applying nursing skills. This can be further explicated by examining the individual performance of one learner on these two behaviors (see Figure 3). To further define the relationship of the performance characteristics of Figure 3, a scattergram (see Figure 4) provides a visual inspection of the day to day relationship of the performances on these two behaviors. It is obvious from examination of Figure 4 that there is a high degree of relationship. This relationship can be further defined as a correlation with a phi coefficient of .75 with one degree of freedom that is significant at the .01 level.

The next group of figures will examine a comparison between the application of nursing behaviors in two separate clinical settings. Figure 5 illustrates the differences between the two clinical settings in the application of nursing skilss correctly. Visual inspection indicates that there is a difference between Setting I and Setting II (see Figure 5). If one examines the performance topography, one can clearly see that in most instances, the celerations in Figure 5, which is Clinical Setting I, are accelerating as would be expected for an acceleration target. However, the accelerations seen in Clinical Setting II do not describe as positive a learning opportunity for the learner. In most instances, there is either no change over time or deceleration

FIGURE 2

GROUP SUMMARY OF FREQUENCIES AND CELERATIONS
OF APPLIES NURSING SKILLS AND CONCEPTS LEARNING
OPPORTUNITIES OVER FOUR ACADEMIC QUARTERS



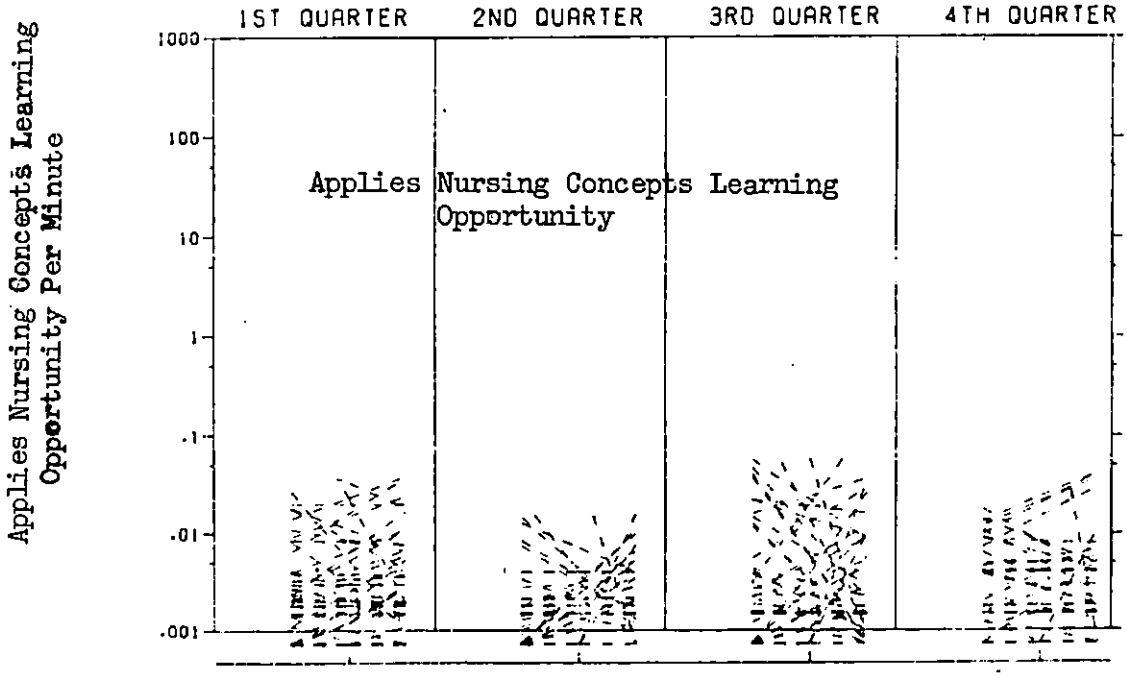
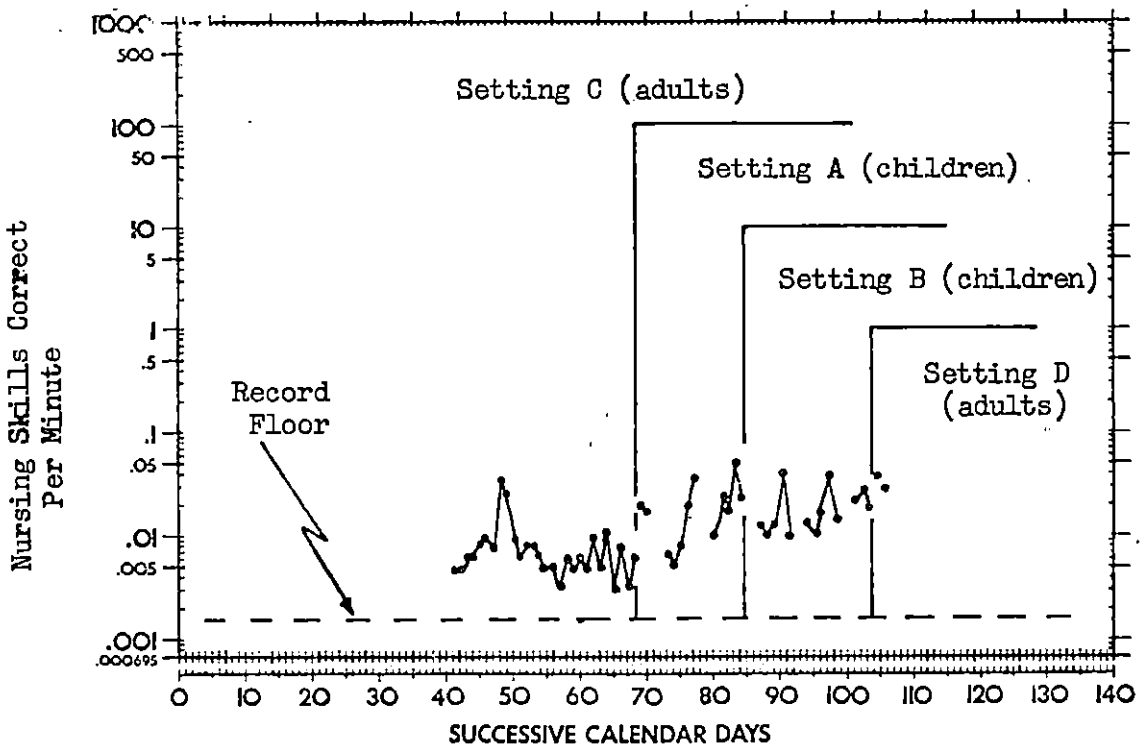


FIGURE 3

DAILY PERFORMANCE RECORD OF NURSING SKILLS AND CONCEPTS FOR STUDENT NURSE 1



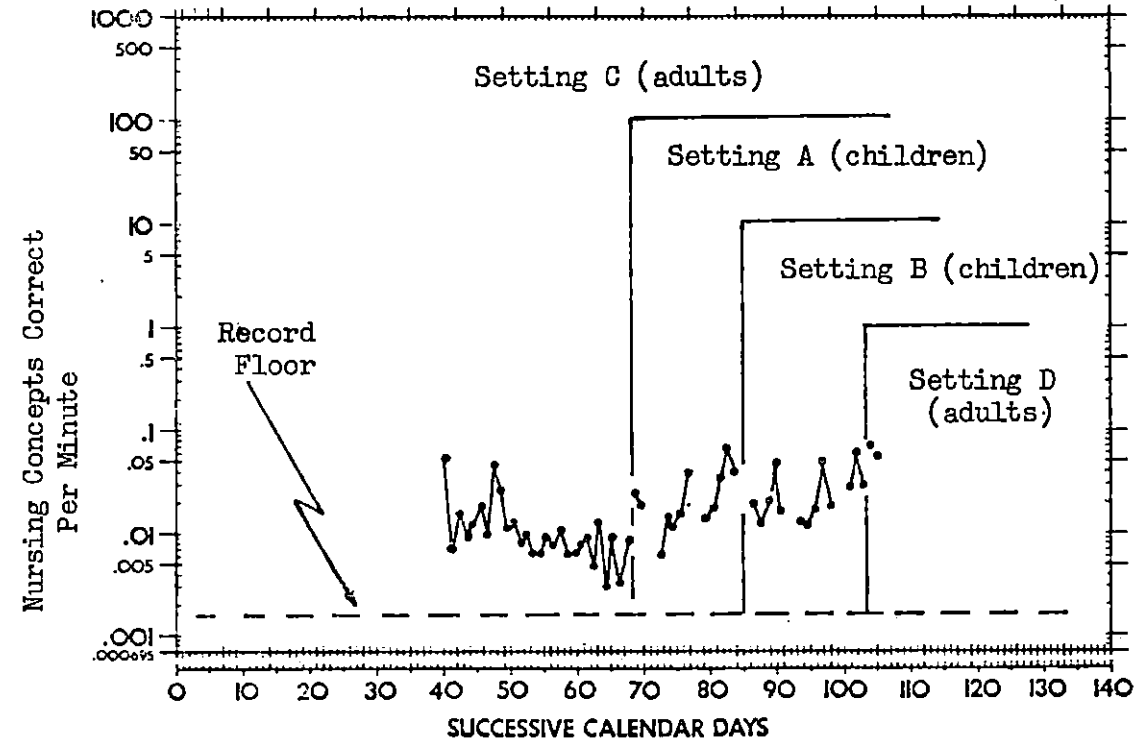


FIGURE 4

CORRELATION OF APPLIES NURSING CONCEPTS CORRECT
AND APPLIES NURSING SKILLS CORRECT FOR STUDENT NURSE I

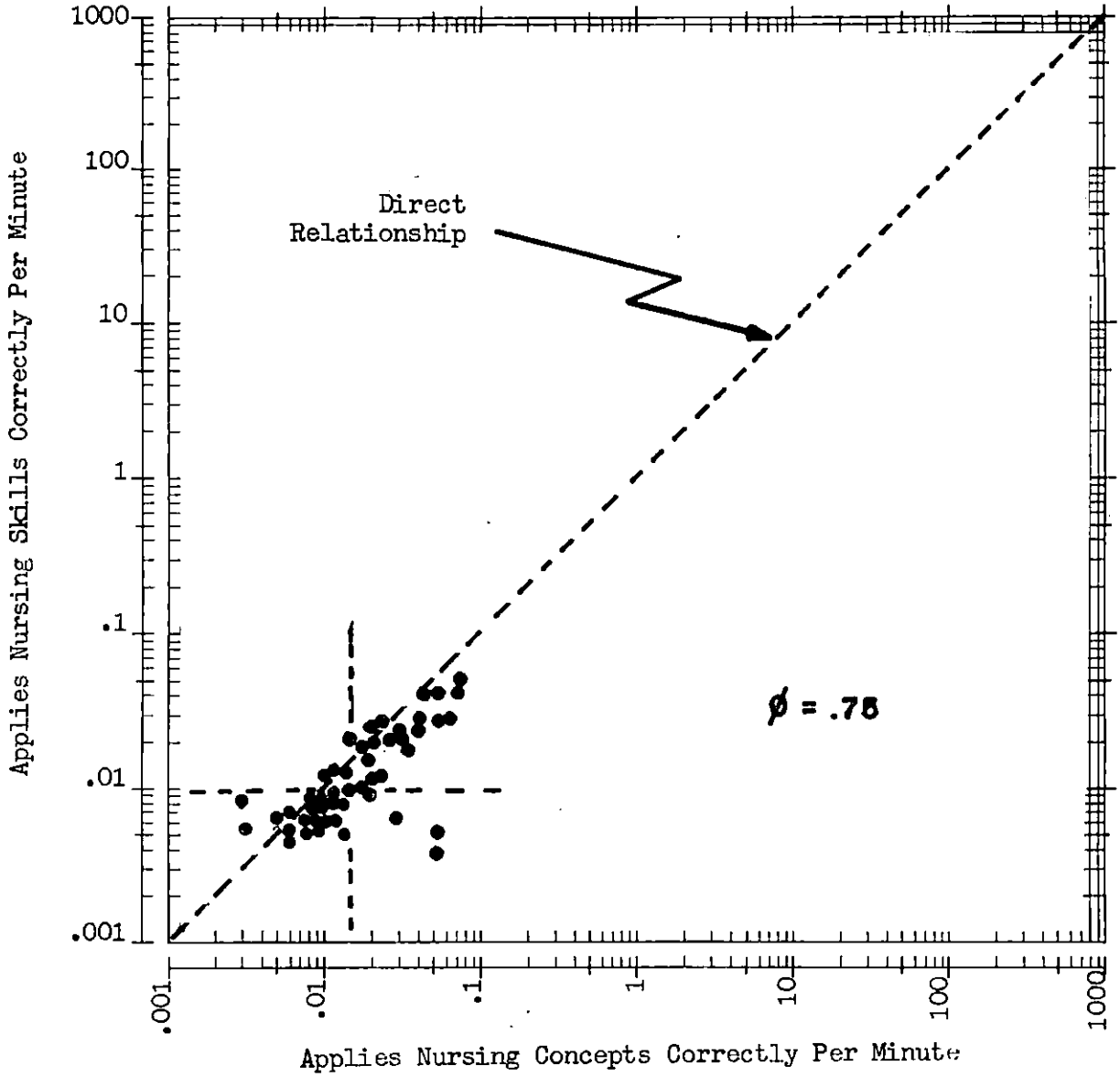
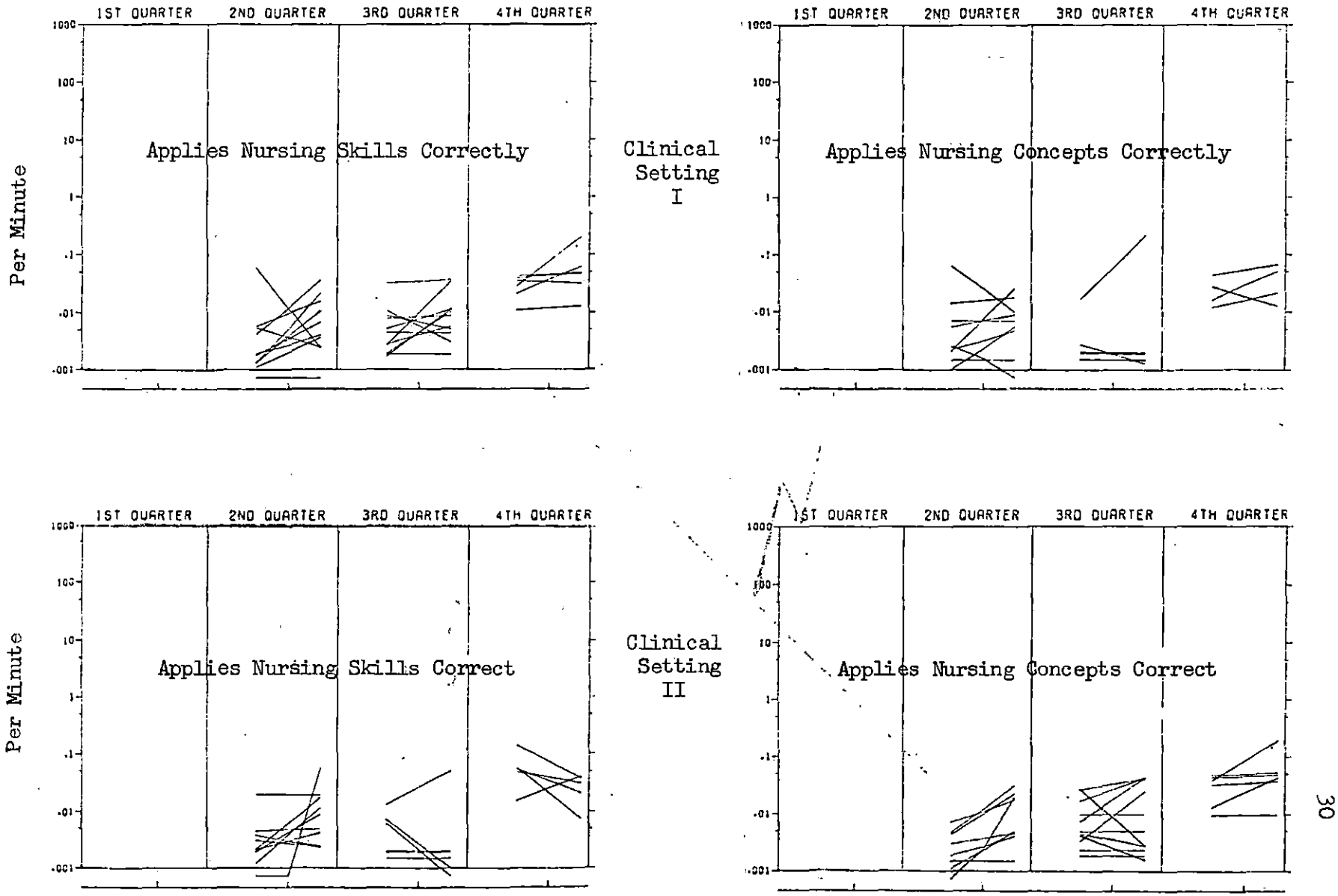


FIGURE 5

FREQUENCY AND CELERATION SUMMARY FOR APPLIES NURSING SKILLS
AND CONCEPTS OF THIRTY STUDENT NURSES ACROSS TWO CLINICAL SETTINGS



for intended accelaration targets. "Applies nursing concepts correctly" for both clinical settings, show like performance characteristics as "Applies nursing skills correctly". The examination of the two clinical settings can be further seen in Figure 6, which shows the number of learners who accelerated (x) and decelerated (÷) during each quarter (see Figure 6). The importance of this last series of charts is to demonstrate the programmatic value of being able to differentiate two clinical settings, which in many respects might casually be described as being similar.

While the previous figures have described the application of skills, Figure 7 describes the learning opportunities for both nursing concepts and skills. While the absolute frequency and the range of frequencies for these performances are lower, the kinds of analyses and statements that were pertinent to the first figures (see Figure 5) are additionally supported by the response classes of learning opportunities that are shown in Figure 7 (see Figure 7).

Figure 8 describes "personalizes patient care" and "depersonalizes patient care" as a response pair (see Figure 8). Both "personalizes patient care" and "depersonalizes patient care" are highly related and show consistent performance characteristics with the relative range increasing only in the fourth quarter. It appears that learners who start high are consistently high per quarter, and learners who start low are consistently low per quarter. That same consistency can be seen in Figure 9, which is the response pair, "teaches patient correctly" and "teaches patient learning opportunity" (see Figure 9). In essence, a student nurse or learner, who comes to the clinical setting with inter-

FIGURE 6

FREQUENCY OF TIMES (x), DIVIDES (÷) CELERATIONS PER ACCELERATION TARGET PER QUARTER FOR STUDENT NURSES ACROSS TWO CLINICAL SETTINGS

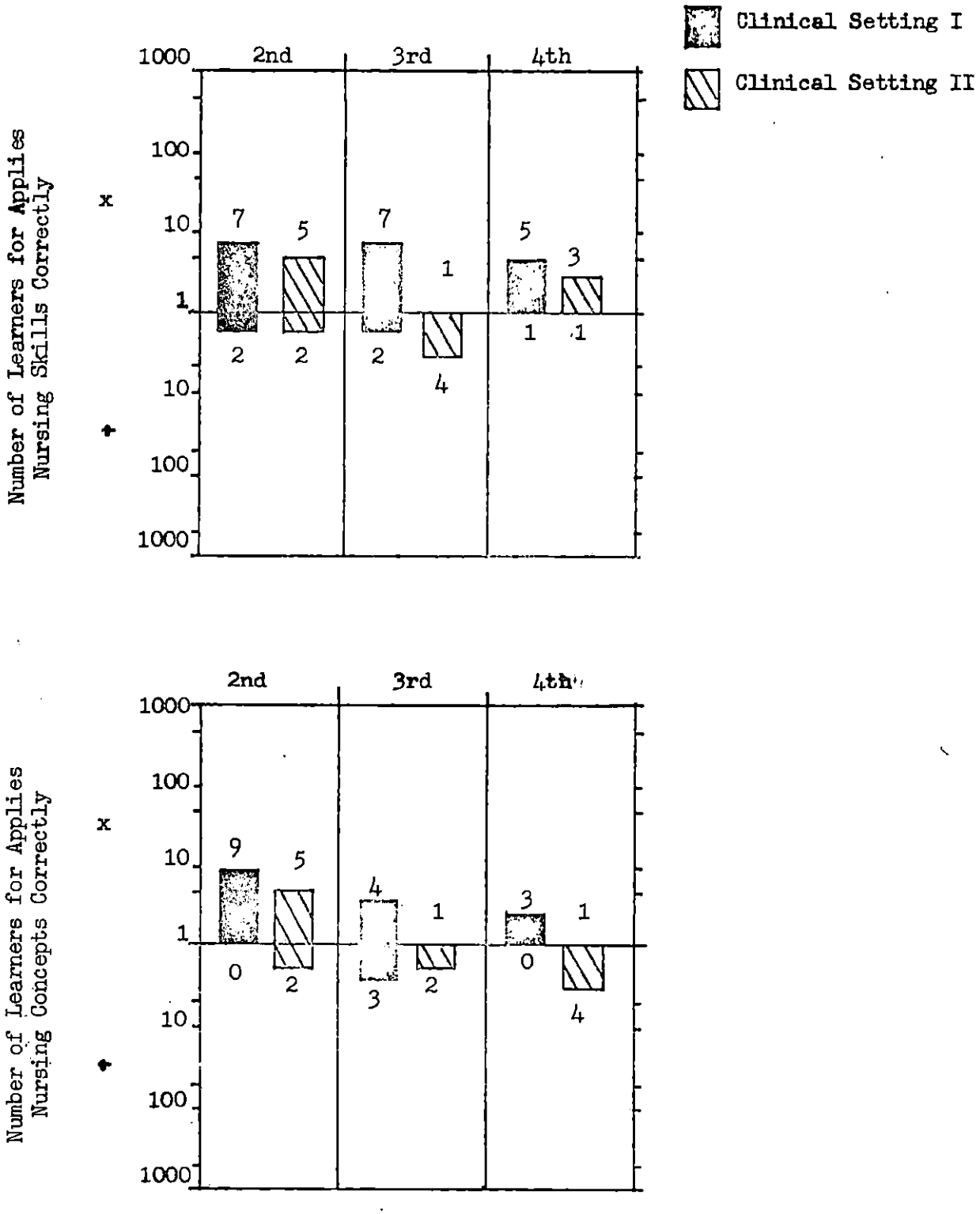


FIGURE 7

FREQUENCY AND CELERATION SUMMARY FOR LEARNING OPPORTUNITIES
FOR NURSING SKILLS AND CONCEPTS ACROSS TWO CLINICAL SETTINGS

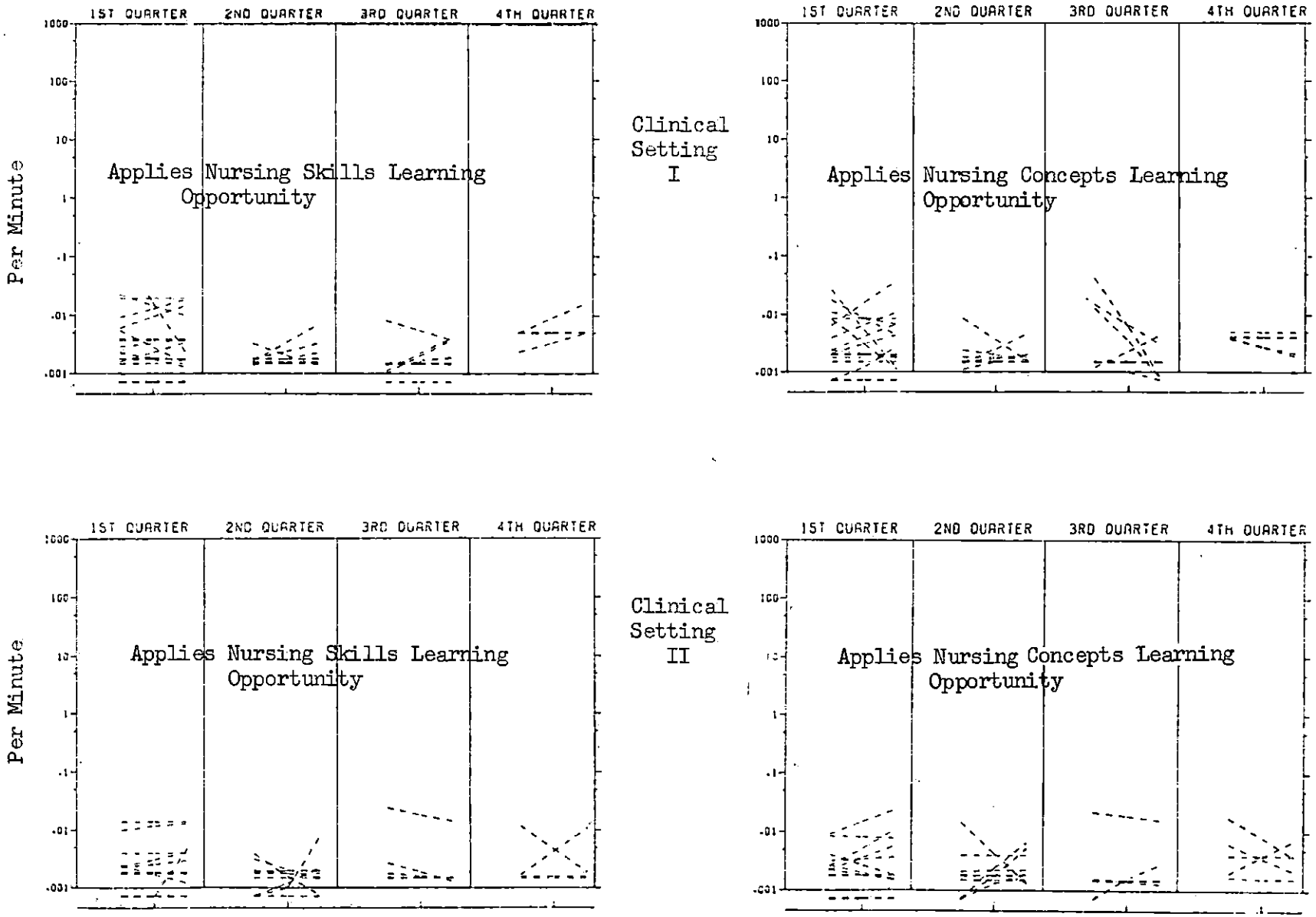


FIGURE 8

FREQUENCY AND CELERATION SUMMARY OF PERSONALIZES PATIENT CARE AND DEPERSONALIZES PATIENT CARE OVER FOUR ACADEMIC QUARTERS

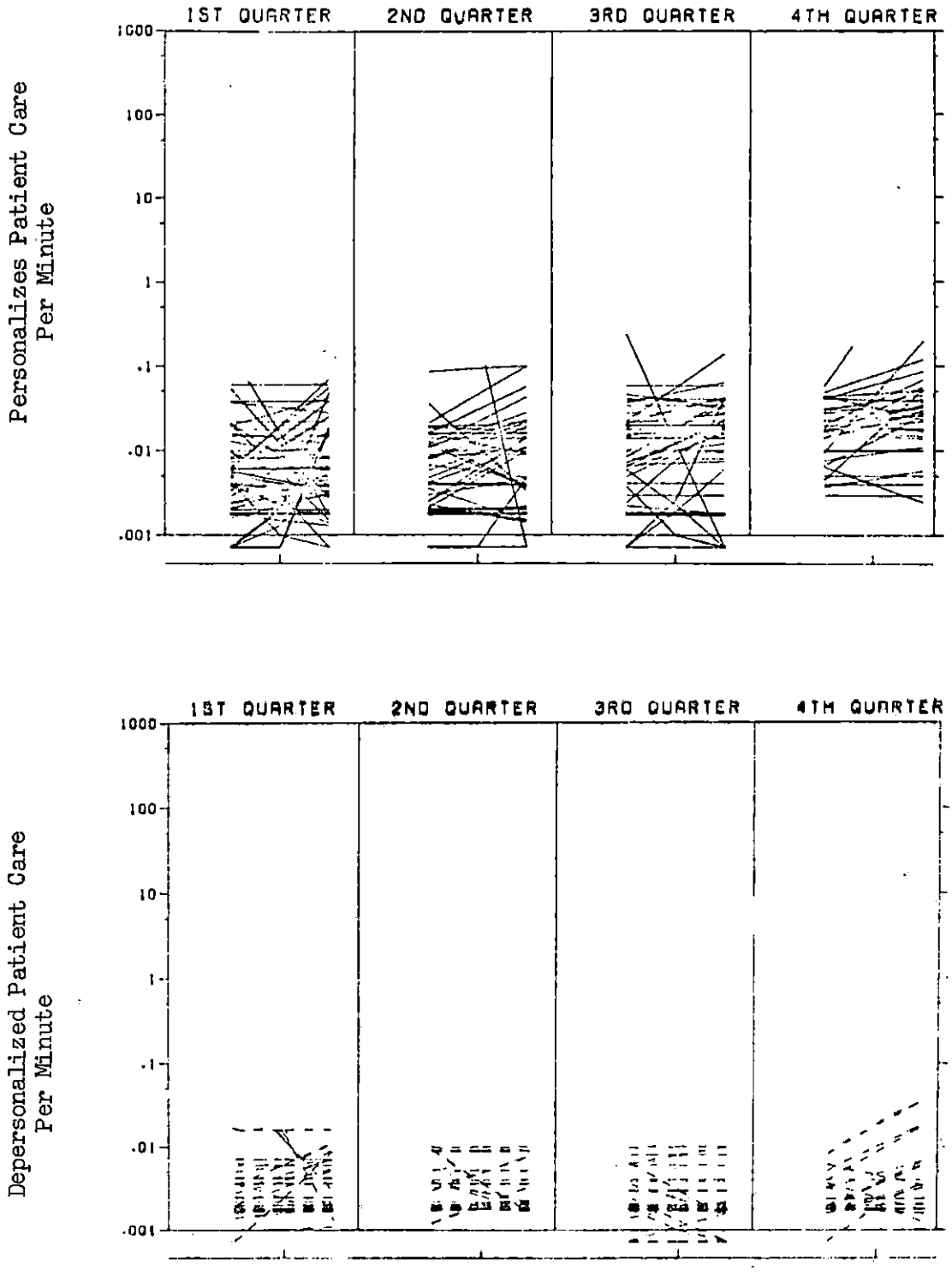
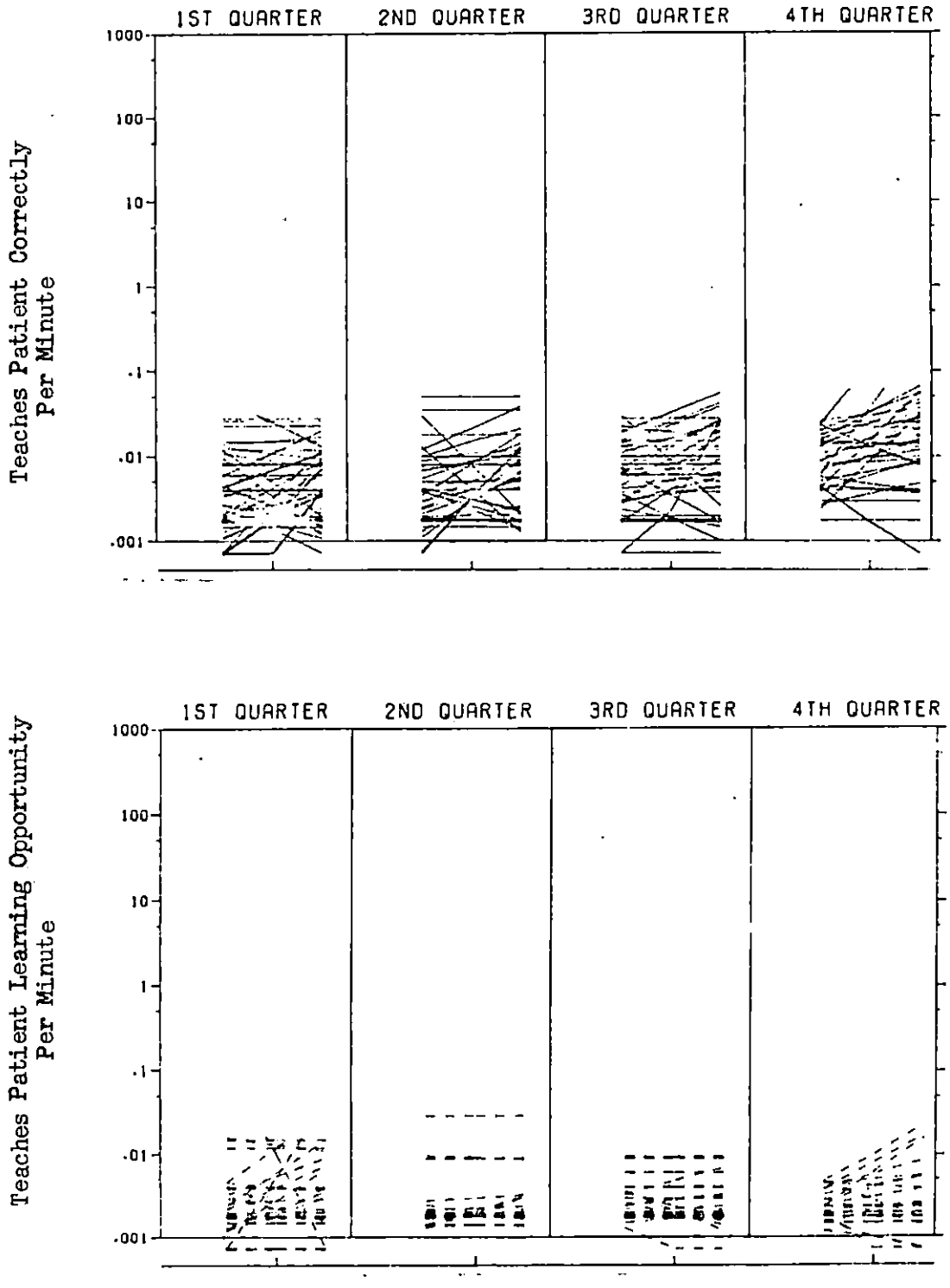


FIGURE 9

FREQUENCY AND CELERATION SUMMARY OF TEACHES PATIENT CORRECT AND TEACHES PATIENT LEARNING OPPORTUNITY OVER FOUR ACADEMIC QUARTERS



personal skills that relate to personalizing care for the patient and teaching the patient particular skills, or in a sense, demonstrate a high degree of concern for the patient, tends not to change as a consequence of that clinical experience.

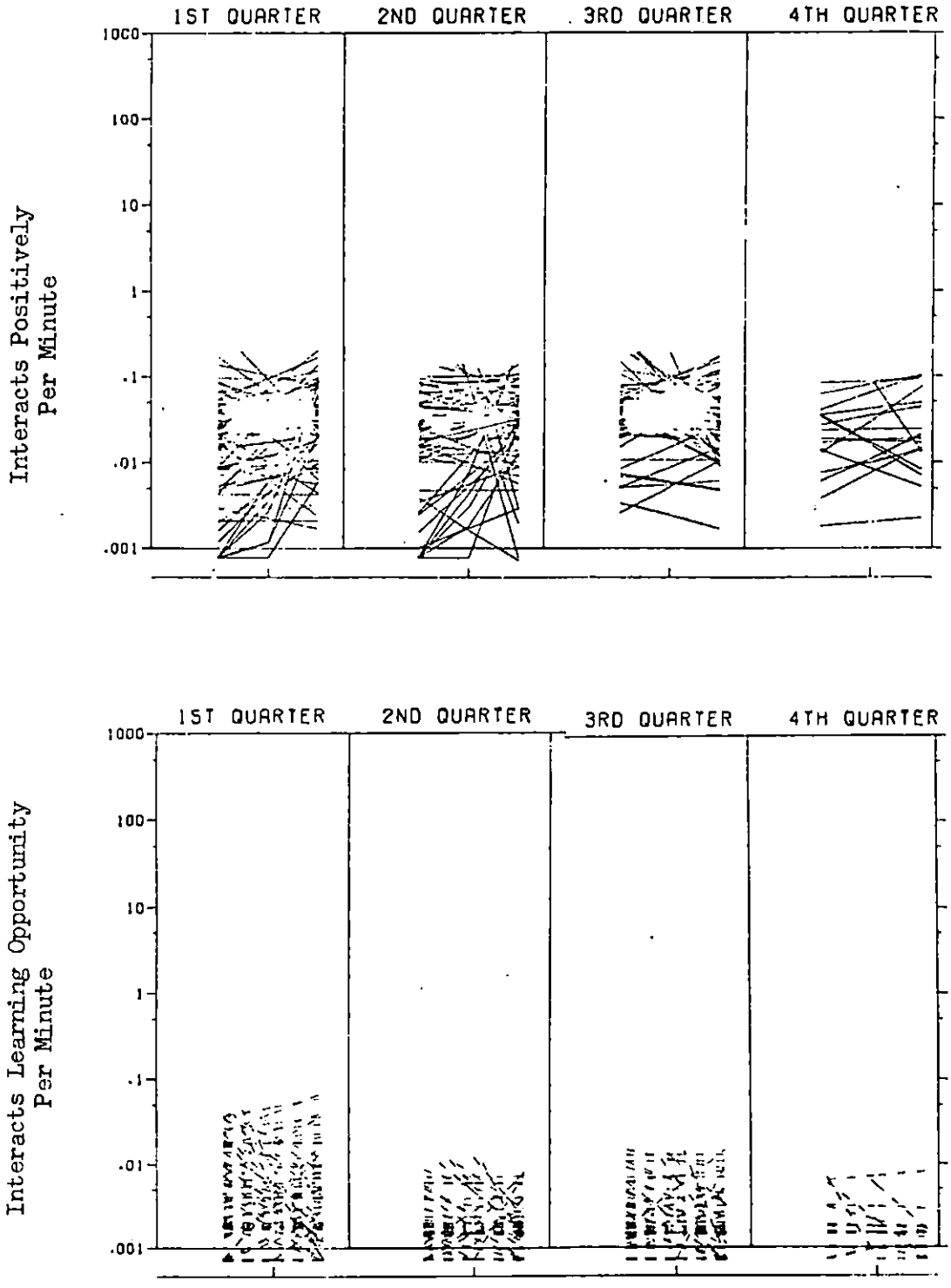
Figure 10 describes the response pair "interacts positively" and "interacts learning opportunity" (see Figure 10). The range of social interaction is from one positive or negative interaction in a thousand minutes to one positive or negative interaction every ten minutes. The median for interaction is once every twenty minutes. "Interacts positively" and "interacts learning opportunity" are characterized by approximately three phase changes per student each of the first three quarters, with a significant drop during the fourth quarter. There are obviously more celerations per acceleration target than per deceleration target. Of programmatic significance is that students report "interacts learning opportunities" in the beginning had a higher component of errors. As students became more sensitive to negative interaction, i.e., not wanting to punish patients, opportunities seen to learn became less.

The preceding figures describe findings from group summaries designed to permit visual inspection of the unique celeration and relative frequency of each learner. The following figures will further explicate a summary of sample learners across all 30 behaviors measured, which includes the five response classes being studied.

Figure 11 shows Student Nurse 2, who is described by the teaching staff as one of the best students in the nursing program. A number of things become apparent in examining Student Nurse 2's performance record.

FIGURE 10

FREQUENCY AND CELERATION SUMMARY OF INTERACTS POSITIVELY AND INTERACTS LEARNING OPPORTUNITY



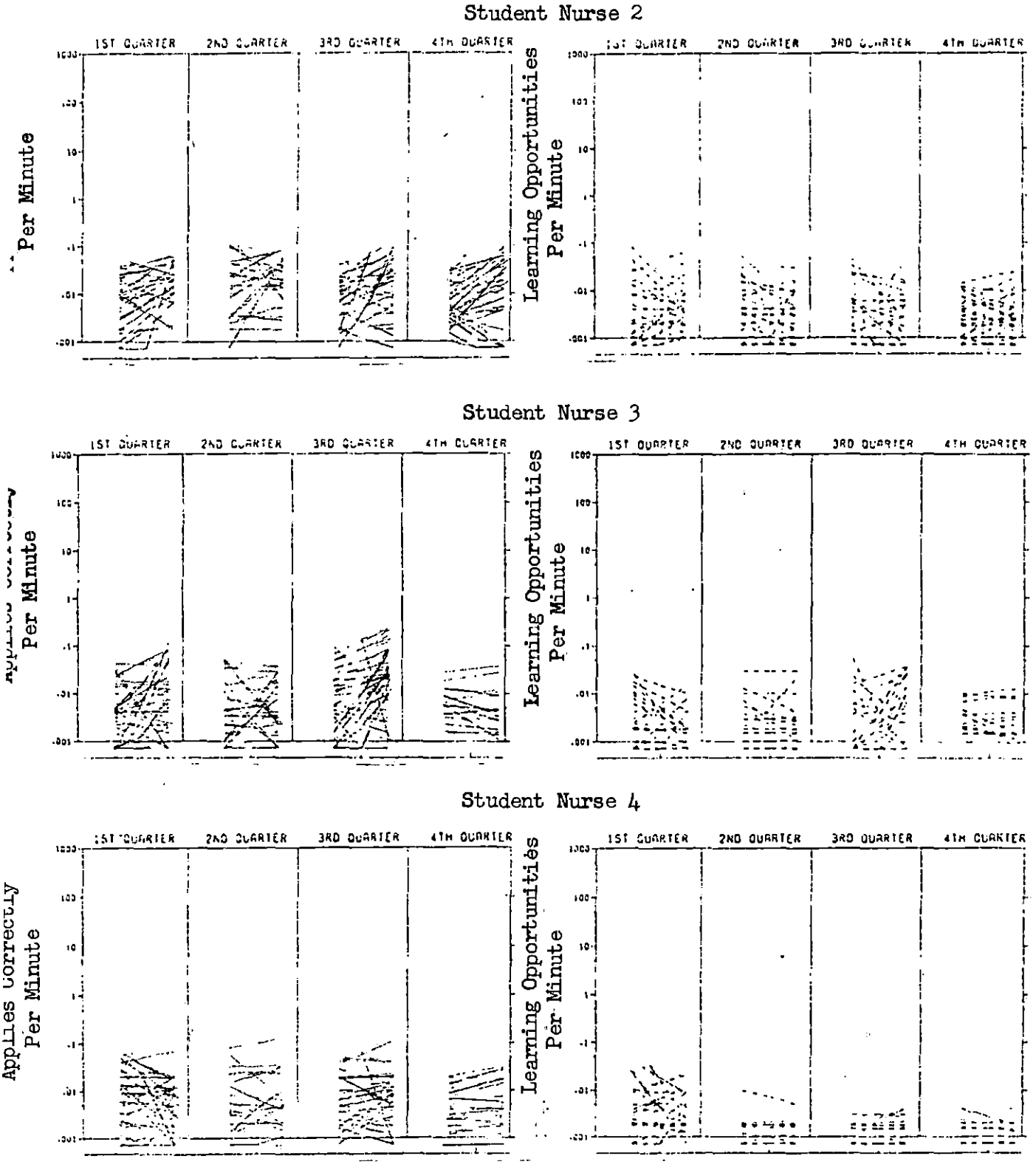
The first is that when one compares Student Nurse 2 with Student Nurse 3, who is the middle student, and Student Nurse 4, who is the poorest student (see Figure 11), we find that Student Nurse 2 makes more program changes overall, which has been previously described as more attempts or tries. This can be found by examining the number of celerations for each quarter. An example would be that Student Nurse 2 had 91 different celeration lines for 30 different behaviors during the first quarter. One outstanding difference is that Student Nurse 2 identified many more learning opportunities than other students. This has obvious programmatic value. Additionally, Student Nurse 2 has proportionally more and steeper acceleration lines than Student Nurse 3 or Student Nurse 4.

The main distinguishing characteristic between Student Nurse 3 and Student Nurse 2 is that Student Nurse 3 has fewer acceleration lines and for the most part tends to be making only slight changes over time. The notion of acceleration and steepness of slopes appears to be cumulative, particularly if one examines Student Nurse 4 (see Figure 11). We can clearly see that most slopes do not change over time, some decelerate, and there is no greater acceleration than times (x) 1.2. Additionally, if one examines learning opportunities, we can state that this student found few situations that could be identified as learning opportunities, which is in marked contrast with Student Nurse 2.

Figure 12, which is Student Nurse 5, shows the overall performance characteristics for an individual who dropped out of the program after three quarters. Student Nurse 5's performance is characteristic of others who dropped out of the program. Visual inspection shows that

FIGURE 11

FREQUENCY AND CELERATION SUMMARY OF THREE STUDENT NURSES ON THE PERFORMANCE OF ALL RESPONSE CLASSES



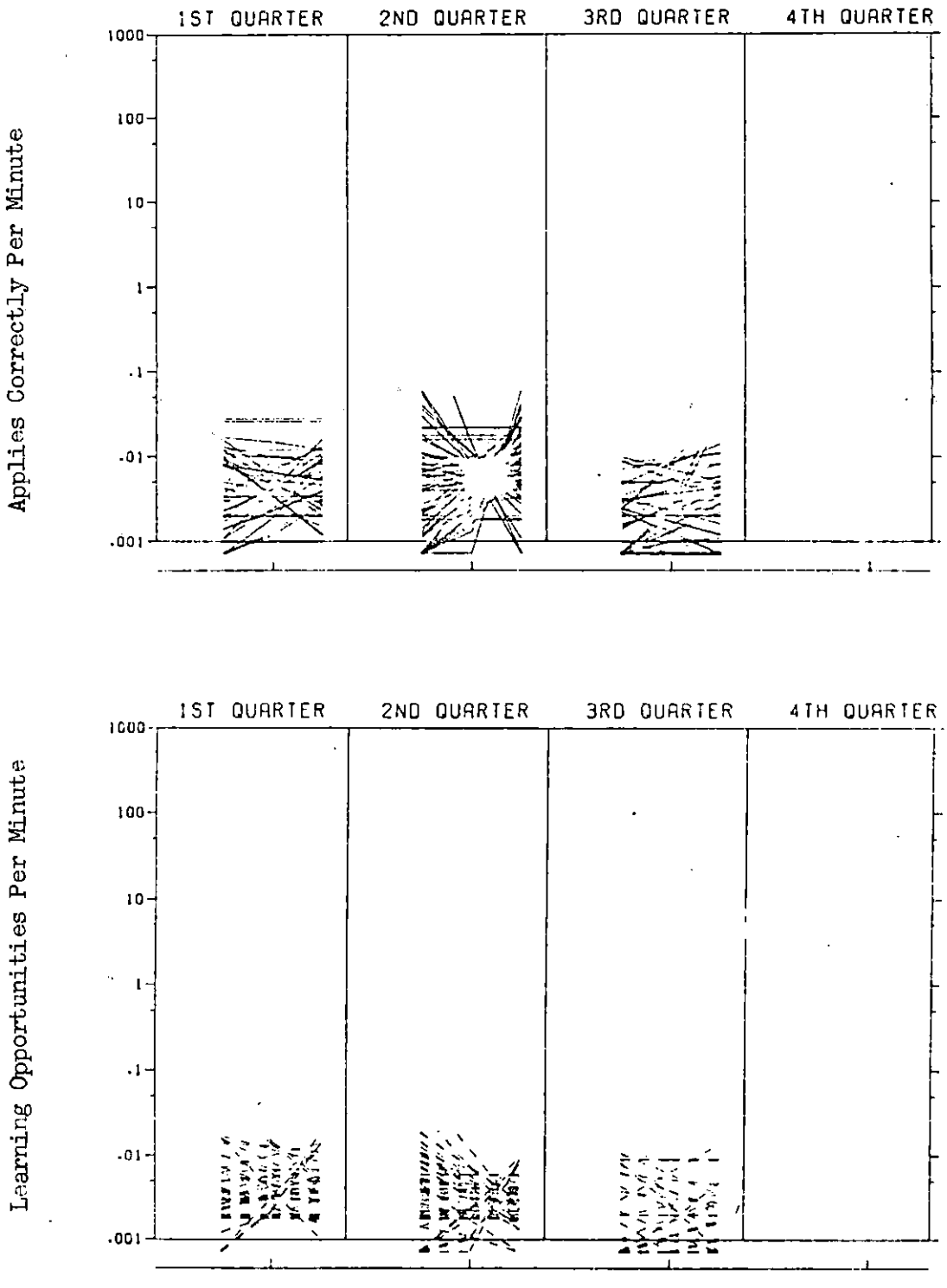
there was no acceleration of performance for most attempts. While there is nothing in the data that would provide explanation as to why there was very little behavior change, one might be led to believe that individuals who drop out of the program have not responded to the learning conditions presented, and tend not to change. This is the picture that Figure 12 provides (see Figure 12).

Figures 13 through 23 illustrate a case study for Student Nurse 6 over the five response class pairs, which further supports the correlation between concepts and skills correct (see Figures 13 through 23). However, for Student Nurse 6, there is no consistent correlation between learning opportunities and applies concepts and skills. All of Student Nurse 6's behaviors accelerate in the desired direction. He has weekly frequency buildups which indicate that he has a higher frequency of response at the end of the week than at the beginning. It should be mentioned that clinical field placements occur at the end of the week, which may have some relationship to the weekly buildup for this particular learner.

The programmatic relevance of examining the daily, weekly, and quarterly celerations and frequencies, and their relative change, is that the student and the instructor are able to predict performance outcomes and plan change that may effect those outcomes. Further, they may together attempt to identify and account for performance variance and bring the behavior under the control of desired stimulus and consequence conditions. The implications of these findings will be discussed in the succeeding section.

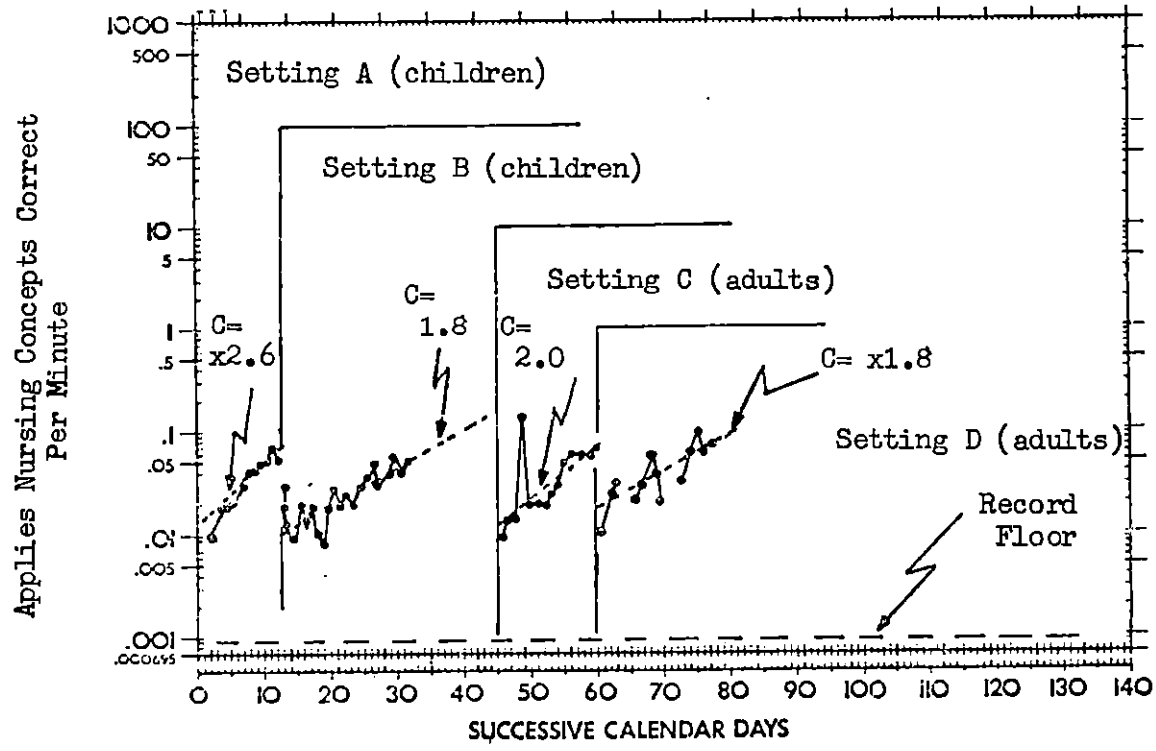
FIGURE 12

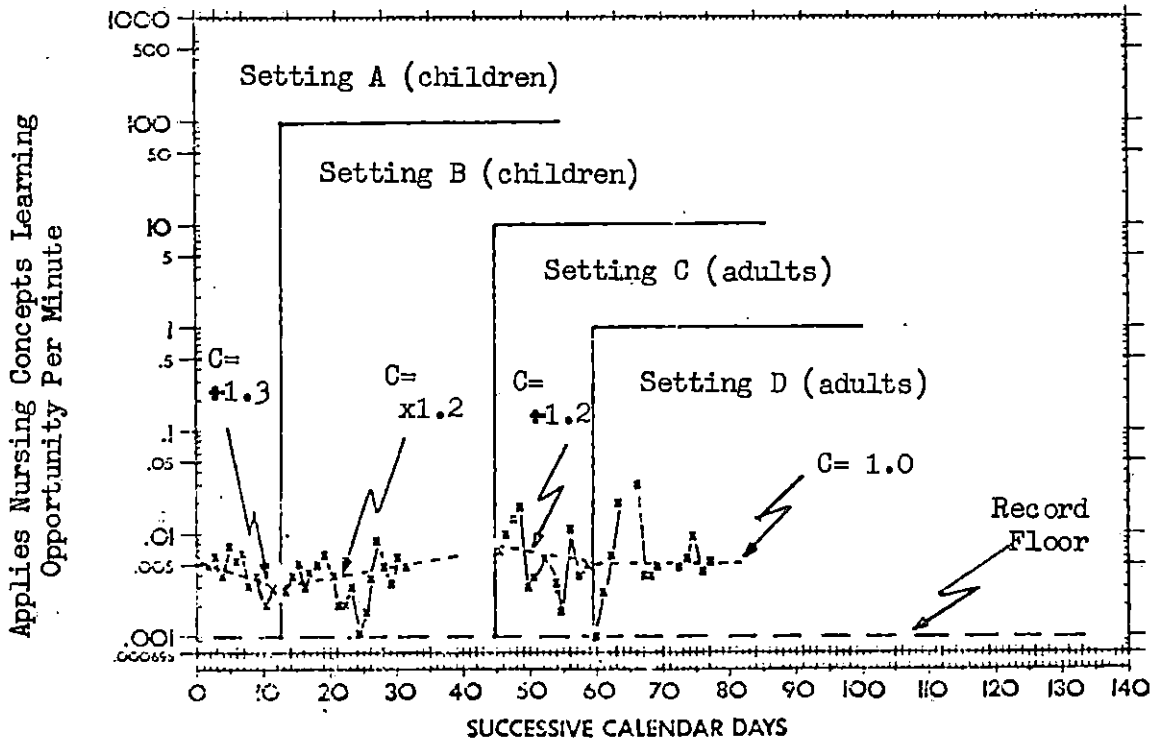
FREQUENCY AND CELERATION SUMMARY
OF STUDENT NURSE 5 FOR OVERALL PERFORMANCE



FIGURES 13 - 14

DAILY PERFORMANCE OF STUDENT NURSE 6 ON NURSING CONCEPTS CORRECT AND NURSING CONCEPTS LEARNING OPPORTUNITY

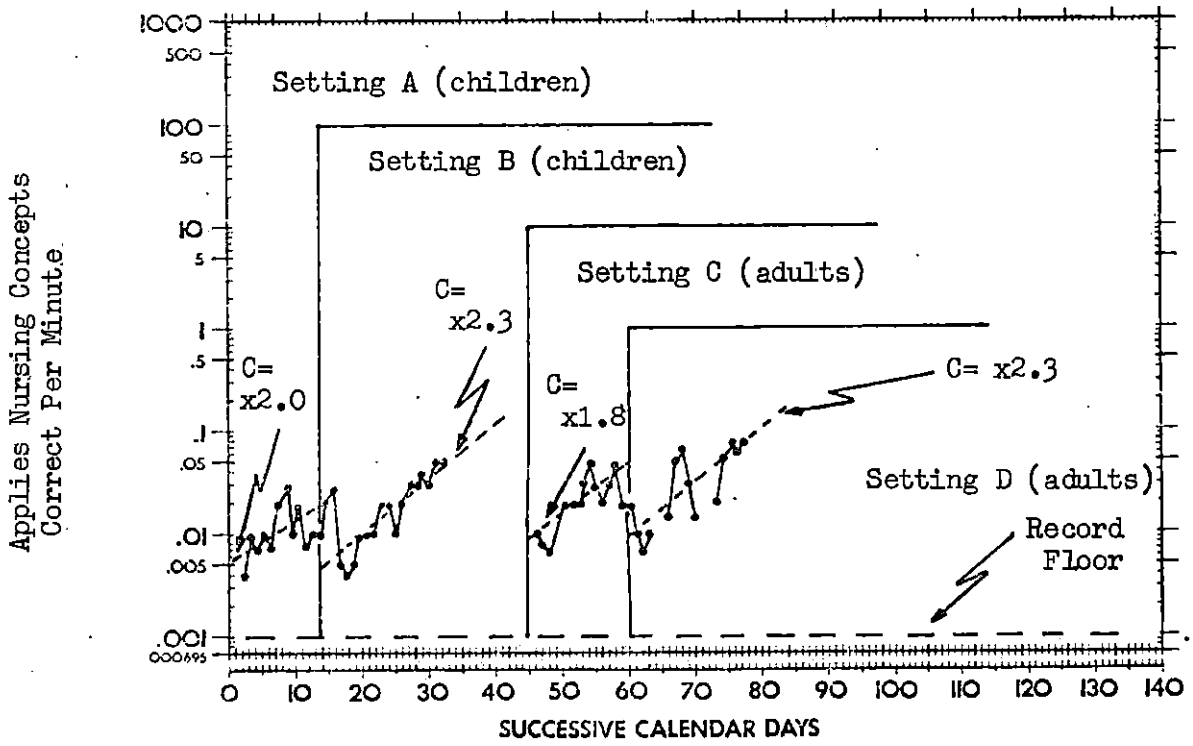


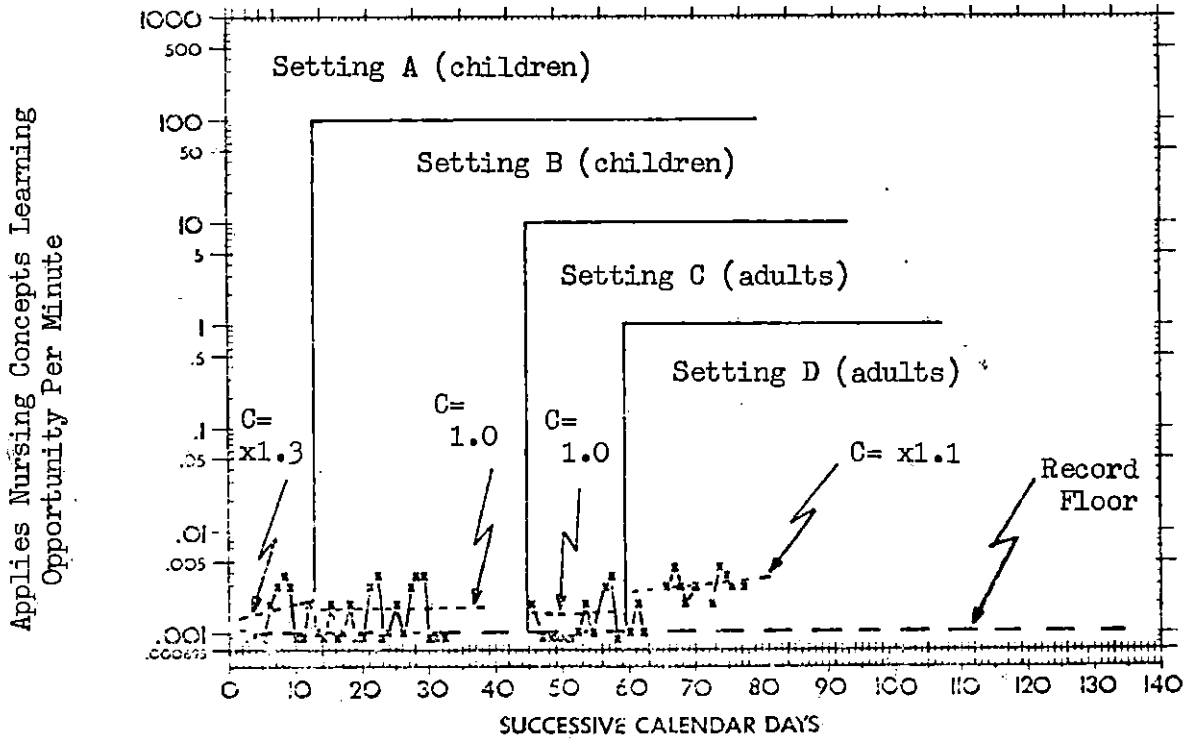


C = Celeration

FIGURES 15 – 16

DAILY PERFORMANCE OF STUDENT NURSE 6 ON NURSING SKILLS CORRECT AND NURSING SKILLS LEARNING OPPORTUNITY

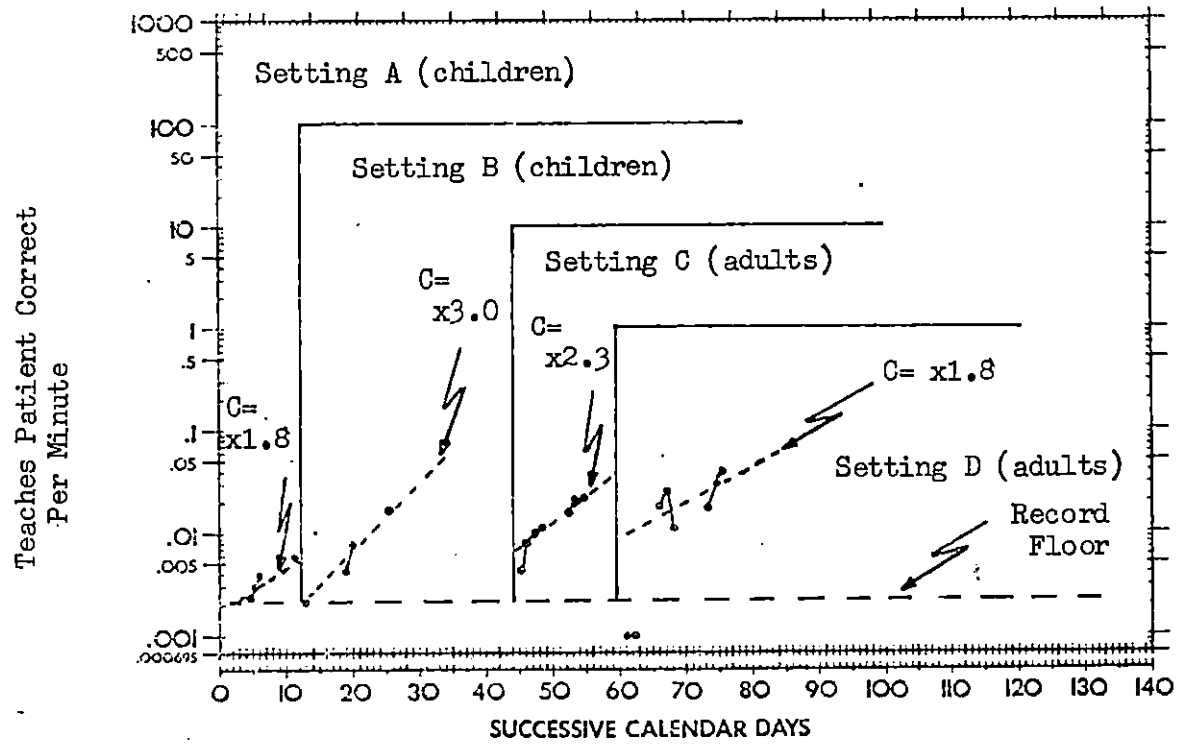


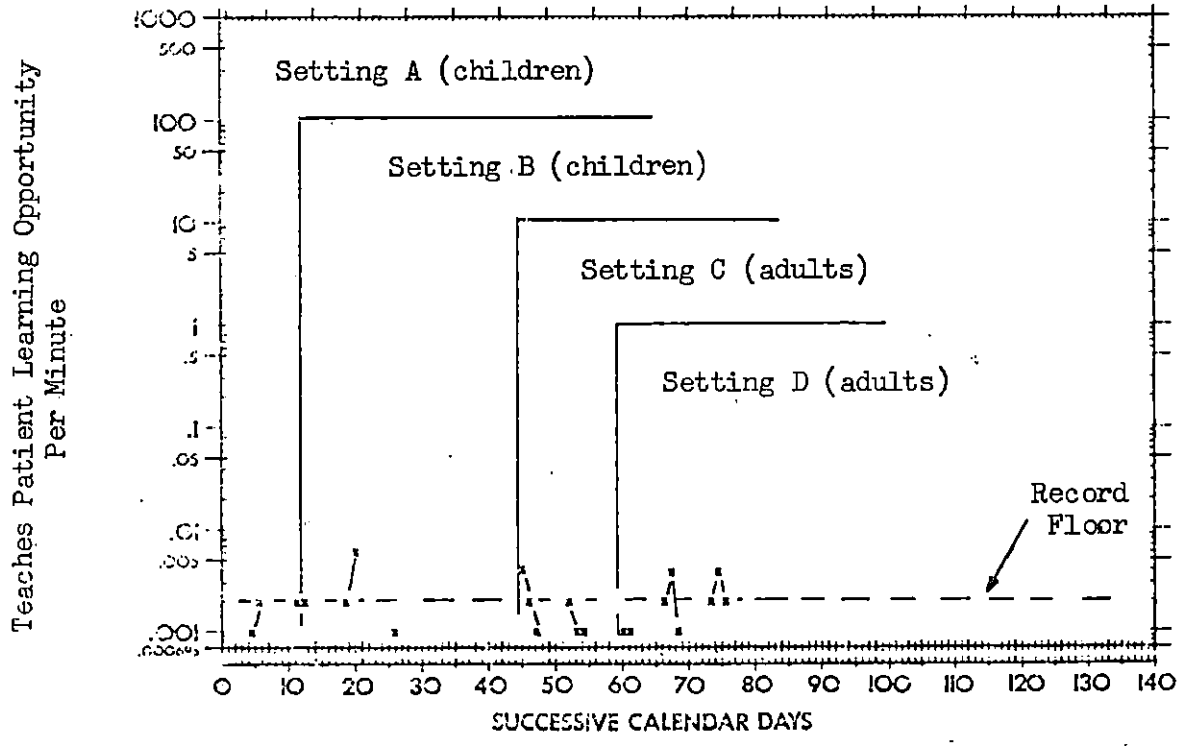


C = Celeration

FIGURES 17 - 18

DAILY PERFORMANCE OF STUDENT NURSE 6 ON TEACHES PATIENT CORRECT AND TEACHES PATIENT LEARNING OPPORTUNITY

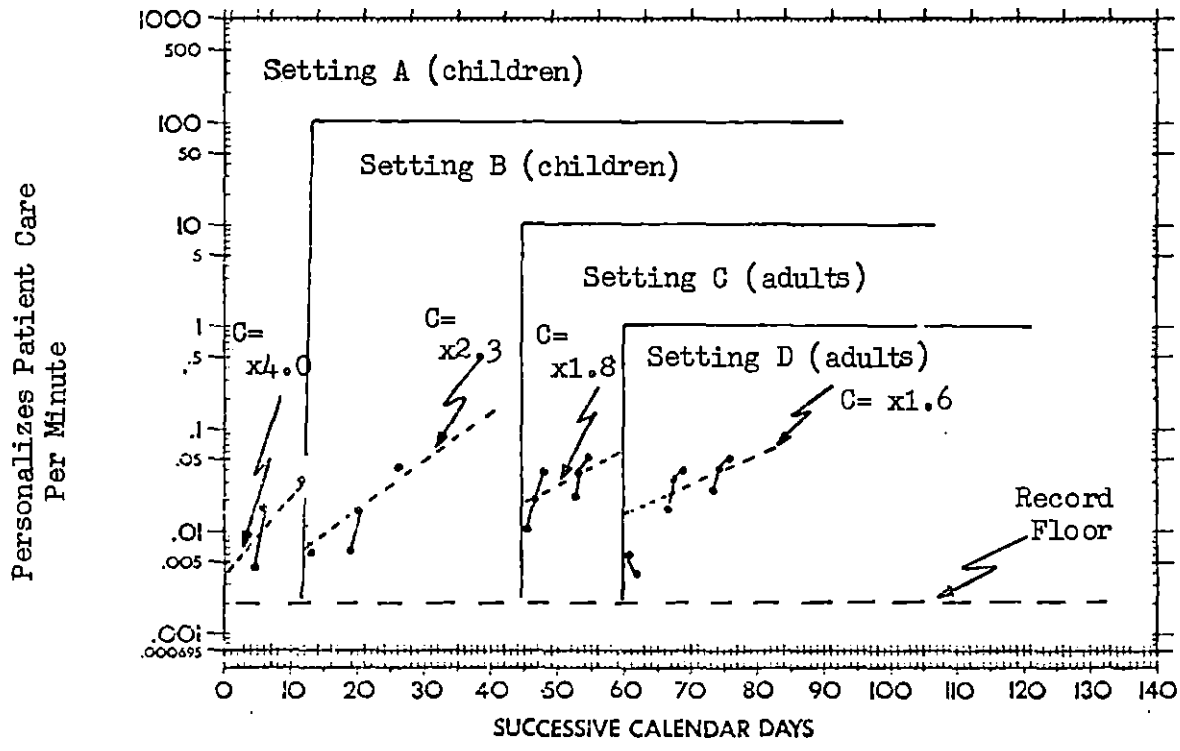


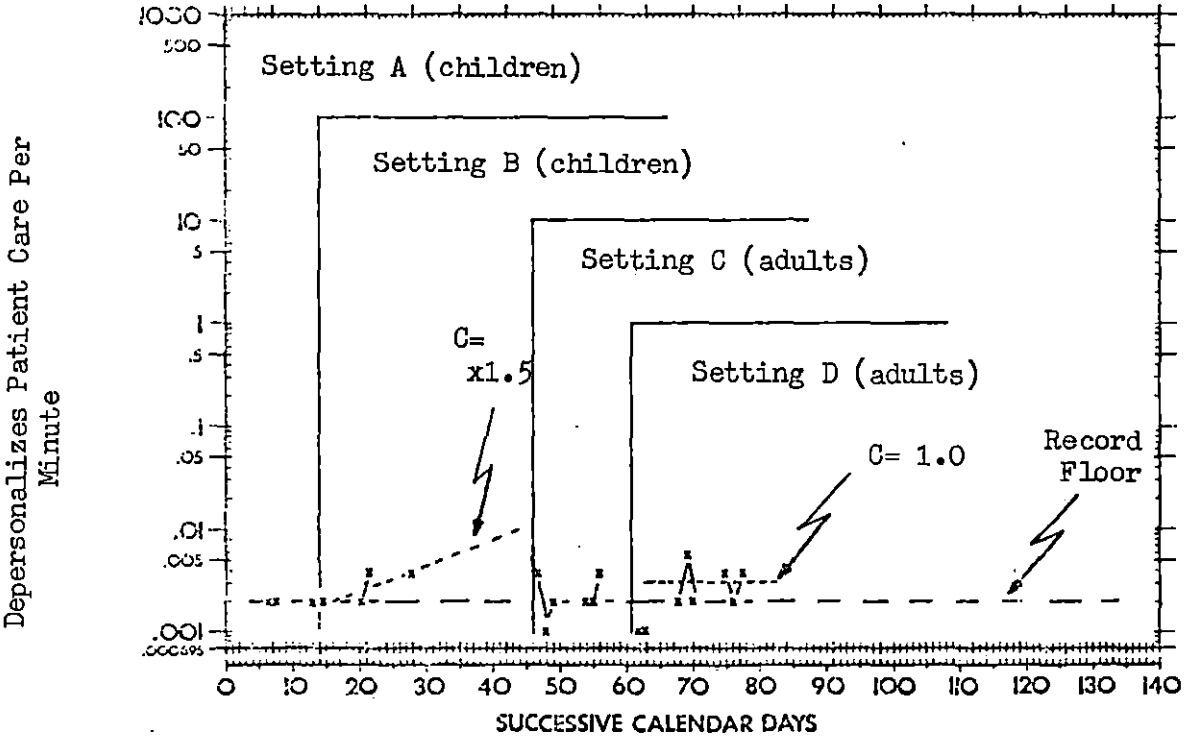


C = Celeration

FIGURES 19 - 20

DAILY PERFORMANCE OF STUDENT NURSE 6 ON PERSONALIZES PATIENT CARE AND DEPERSONALIZES PATIENT CARE

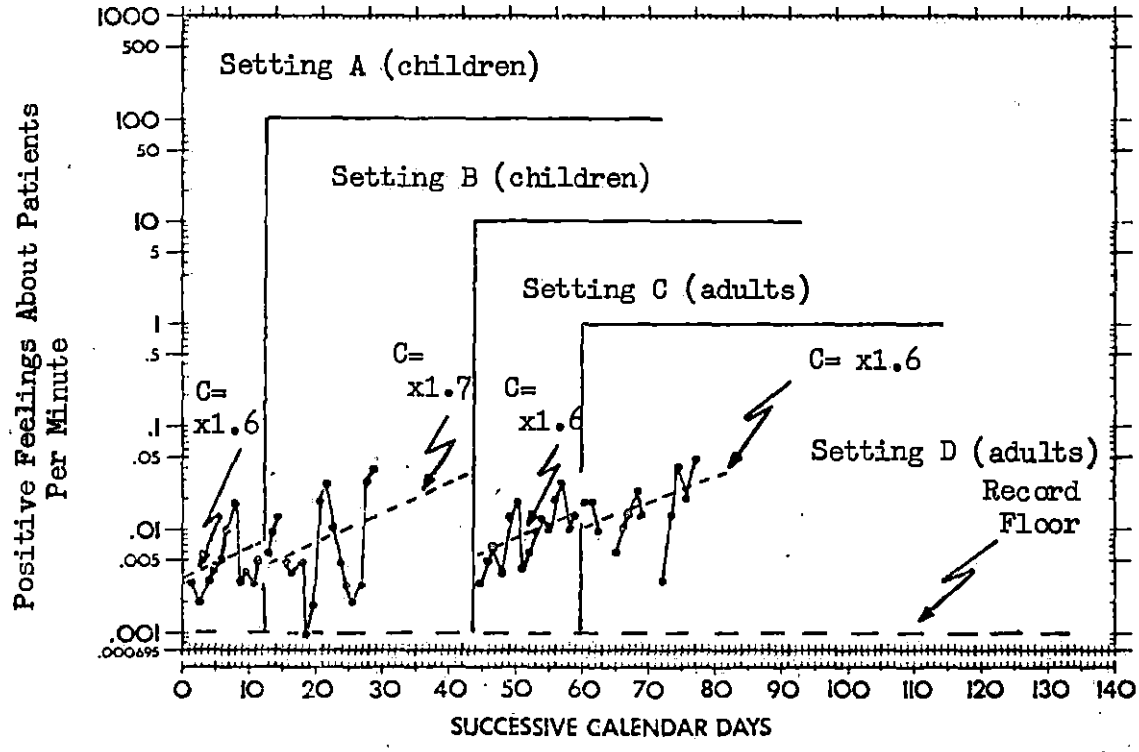


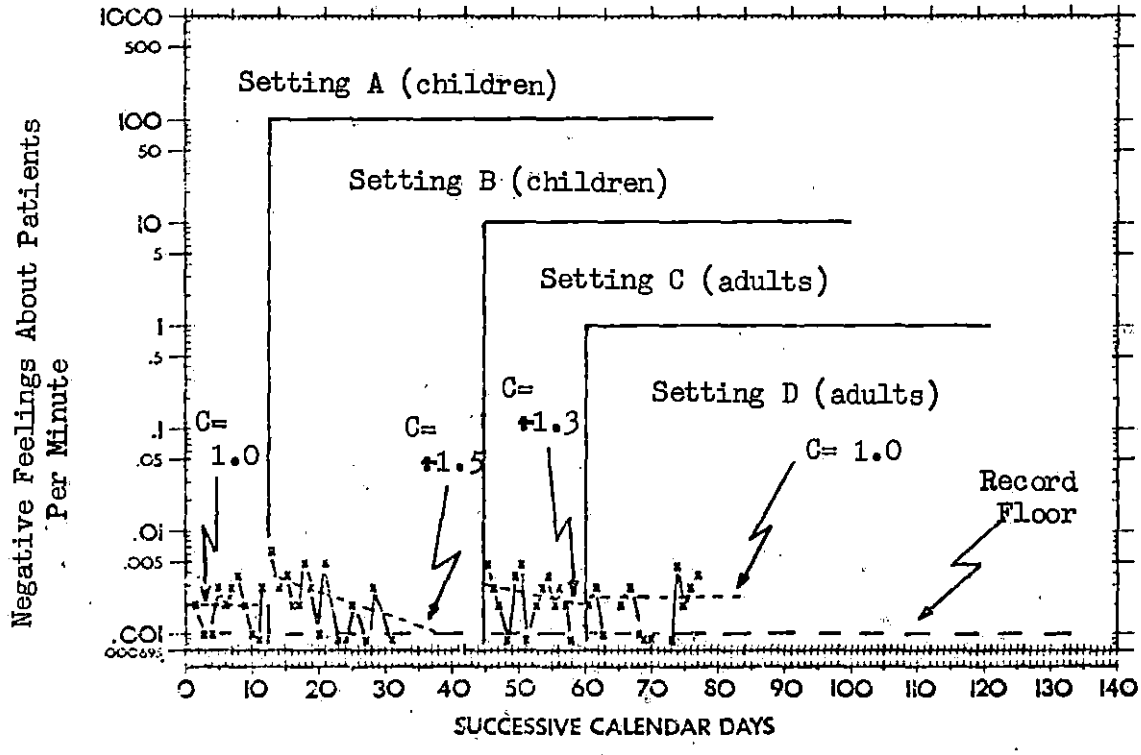


C = Celeration

FIGURES 21 - 22

DAILY PERFORMANCE OF STUDENT NURSE 6
ON POSITIVE AND NEGATIVE FEELINGS ABOUT PATIENTS

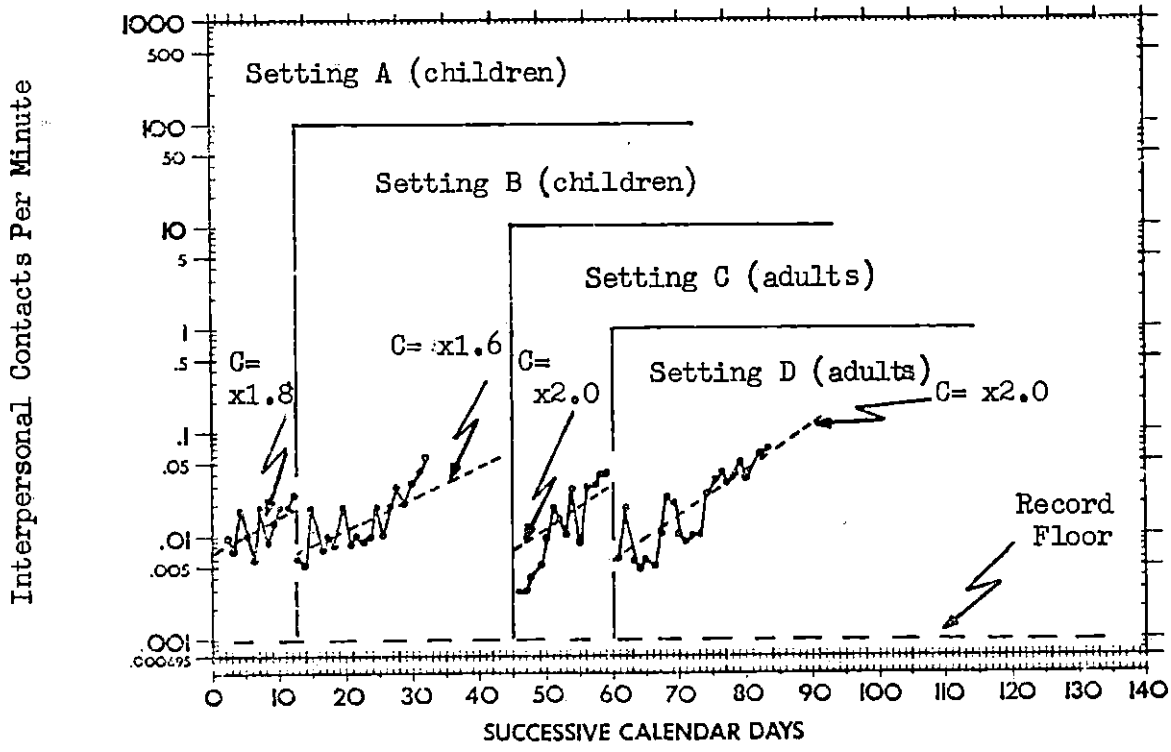


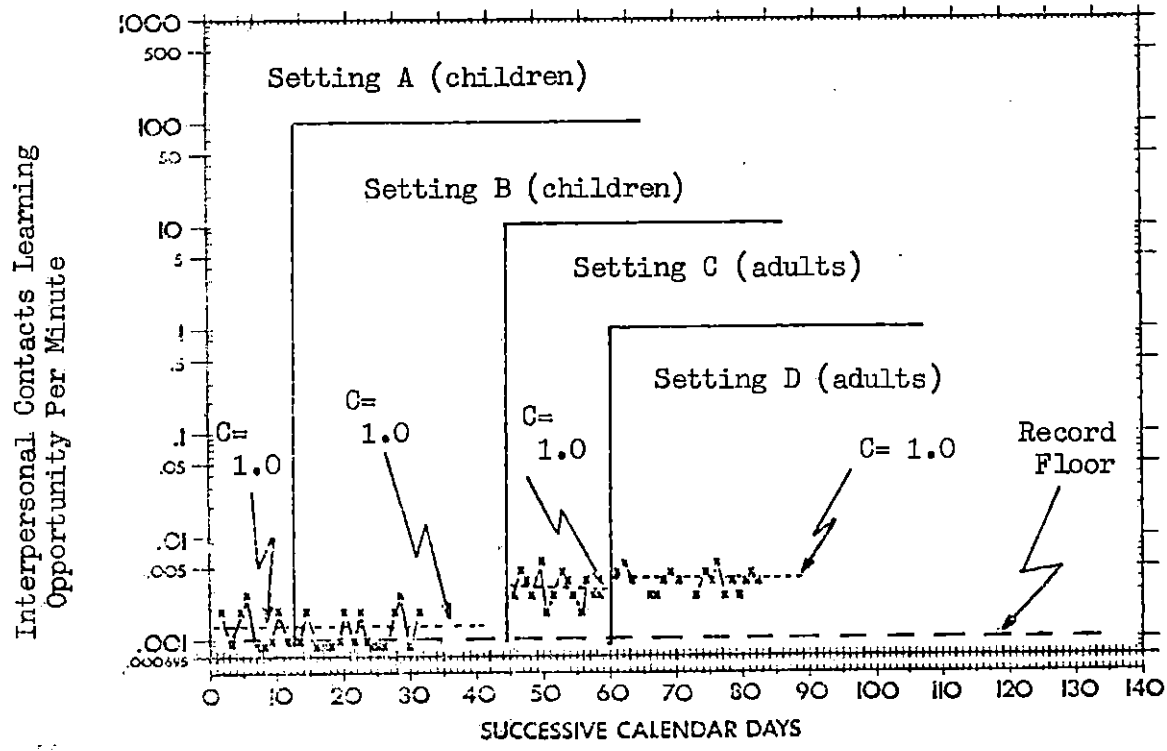


C = Celeration

FIGURES 23 - 24

DAILY PERFORMANCE OF STUDENT NURSE 6 ON INTERPERSONAL CONTACTS CORRECT AND INTERPERSONAL CONTACTS LEARNING OPPORTUNITY





C = Celeration

DISCUSSION

The results of this study permit us to state: 1) that behaviors presented as competencies in the classroom and simulation laboratory were in fact acquired (learned); and 2) that this learning transferred as evidenced by the occurrance of the acquired competencies in clinical field settings. In addition, the results allow us to raise specific issues with a reasonable degree of certainty.

Figures 1 and 2 indicate some degree of correlation between "applies nursing skills correct and learning opportunity" and "applies nursing concepts correct and learning opportunity". This relationship is demonstrated further by a correlation between application of skills and concepts for Student Nurse 1. This finding supports an implicit assumption held by the nursing faculty and professional education program faculties in general that indeed there "should" be a direct correlation between cognitive behavior and nursing actions, that in fact, the behavior of the professional directed toward his client "should" be directional, goal oriented, with purpose, and with sound theoretical and conceptual frames of reference. This finding further implies that these two pairs of responses have the same performance characteristics such that a measure of one could predict the other. It raises the question as to which behaviors when measured yield predictive validity for themselves as well as which other behaviors. It is likely that if we specify a relationship as we have with application of skills and concepts that we are likely to obtain it. It further is likely that we can

identify correlated response classes in which only one behavior need be continuously measured and the others measured intermittently. This would provide economy of measurement as well as information regarding which behaviors fall under the control of similar stimulus and consequence conditions.

This highly correlated relationship between concept and skill behavior is a finding relevant to any educational endeavor which has acquisition as well as application concerns. As educators we have long been concerned with the felt need to validate that learning has generalizable properties and transfers from the acquisiton setting as application.

Further research might yield more specific information regarding which learning conditions are most likely to yield correlated response classes and might test for correlated relationships between frequency and celeration changes. It is difficult here to suggest causal relationships; however, we can attempt to replicate learning conditions such that there is a direct and positive stimulus-response relationship between learning conditions and learning outcomes.

Figure 4 allows us to state that the correlation held by the group can be borne out in the data for individual students. Student Nurse 1's information illustrates this point. An examination of each learner's measured performance permits exploration as to whether the learning conditions that hold for a majority hold for a unique learner. It further suggests that by looking at the variance as a performance characteristic, we might ascertain specific information regarding the performance of the individual learner such that the learner can obtain information that may allow for self-control as well as serendipitous information regarding his unique responses.

The importance of this finding to the educator is that it allows information which may be true for a group of learners to be tested as to its truth for each individual learner. It becomes important to discover or create measures which yield group summary information and at the same time protect the integrity and uniqueness of the individual.

Future study would encompass an examination of the effects of variance across learners and within learner performance. The goal would be to account for that variance.

The examination of performance in different clinical settings helps to begin to sort out those parameters that assist in providing positive learner environments. This was clearly demonstrated in Figures 5 and 6. The programmatic importance of this is that we can begin to ask the question as to why two clinical settings, which to cursory examination would suggest no difference, would produce such characteristically different responding on the part of learners. It is interesting to note that these charts first alerted the author to the fact that the quality of clinical experiences, i.e., the frequency and celeration of behaviors of students, was highly related to the staff person assigned, which programmatically led to the decision to rotate instructors in an attempt to ascertain the difference between faculty and agency effects.

Field placement and practicum settings have long been a troubled area for educators. There is need to determine which settings have a positive effect on learner performance outcomes. Moreover, there is a need to specify what comprises a "good" field placement. Students and faculty alike have expressed concern that it is hard to practice what is learned in class in the "real" world. Perhaps if we can explore

the conditions in the "real" world which effect performance, then we can better equip students with behaviors that allow for both success and competence.

Future research should explore the conditions which effect student learners in field placement settings.

Further, field placement personnel who receive students can become more specifically involved in a learning process which specifies expectations and outcomes. This involvement of receiving personnel also needs further study.

It was additionally interesting to note that the data on "personalizing patient care" and "depersonalizing patient care" could be used to support concerns of nursing programs on admission criteria related to interpersonal skills; that is, it appears from the data displayed that a great deal of change does not occur with regard to the frequency of interpersonal skills, with the exception that learning opportunities decrease over time. The logical questions that arise from this are: 1) Is it important to increase the frequency of interpersonal skills for those who have low frequencies? 2) Can the program establish contingencies sufficient to alter that behavior? or 3) Should students be selected on the basis of existing interpersonal skills? These comments could, of course, be directed at all behaviors.

Another alternative in examining this particular set of results would be to further suggest that the behaviors that are specified for interpersonal skills are more difficult to specity as they involve assessing feelings, attitudes, and beliefs. These inner behaviors, while being observed only by the learner seem to respond in large measures

to learner self-management.

More emphasis needs to be placed on the specification of behavior in the affective domain. In most cases, faculty would be able to go directly to outcome rather than focus on inferences regarding affective behavior. This development of objectives and measurement of the affective domain has utility for educators interested in teaching changes in belief, values, attitudes, and interactive behavior, and holding the student accountable for this learning. Historically, subjective assessment by the teacher and verbal report by the learner were the primary indicators of affective change.

Future research should search for additional information regarding the relationship between thinking, feeling, and overt behavior, and especially the correspondence between words and deeds. For the professional it might additionally be important to assess the effects of certain of his behaviors on those of his client.

Examination of the four students provided additional support that: 1) differentiation of students is possible; and 2) there are parameters that are generally not attended to in the evaluation of student performance that if discovered for an individual could promote better overall outcomes for that student. The primary example provided with that series of figures was that the good student attempted more program changes in order to increase frequency.

Of central concern for most educational programs is the determination of characteristics which differentiate the "good" learner from the "poor" learner. If we can discover some non-content related attributes of the "good" learner, perhaps we can teach these attributes to the so-called "poor" learner.

It is important to stress that the three types of data that were shown in this study, i.e., group summaries, individual summaries, and individual day to day, provide different information that is relevant for the student's learning experience.

Figures 13 through 23 illustrate that day to day performance can help the student in monitoring carefully his clinical experience. The problems that may arise are discovered quickly and can be ameliorated when identified and do not have to wait until the academic quarter ends for final evaluation. Evaluation of learner performance then is in-line and ongoing. Thus, evaluation becomes instructional.

It is obvious from the results section that the three data sources described meet needs of the institution, the program, the learner, and, of course, it is hoped that ultimately in this case, the patient.

This study has described the critical components of a competency based curriculum in nursing, and has demonstrated the application of those competencies in clinical field settings. Issues regarding use of various data have been discussed. The programmatic implications of these findings are most significant in that they: 1) allow the learner, the nursing instructors, and the administrators to make specific and quantitative statements about the frequency and celeration of the acquisition of nursing behavior in the acquisition environment, i.e., the classroom and simulation laboratory; 2) allow the learner, the nursing instructors, and the administrators to make specific and quantitative statements as to the application of learned nursing competencies in the clinical settings and to the frequency and celeration of those competencies; 3) allow the learner and the instructor to examine the frequency

celeration, and patterns of acquisiton; 4) allow the learner to predict the outcome of his own learning at any point in time and anticipate needed change to meed goals and/or expectations; 5) allow for the summarization of information which facilitates the formulation of questions which can be researched and/or examined in depth and with specificity; and 6) allow data regarding learning outcomes to be brought to bear on each level of decision making: learner, instructor, and administrator.

Implications for future study are immense. Heretofore, we have raised questions regarding learning with sparse information to indicate a question was warranted. We now have, with data, raised many questions which seem answerable with a series of future and related studies. We have accounted for two variables often confounded: that learners acquire behavior to specified competency, and that learners apply that competence in the clinical setting in which he is ultimately to work as a professional. Much work is needed in order to understand which various learning conditions effect the acquisition and application of competency. Studies are needed to examine the relative merits of specific behaviors from among a long list possible to learn, and the effects of the application of behaviors on the health status of the client. Further, cost benefit effectiveness needs to be ascertained concerning each component of the learning environment, the cost to the providers of education, and cost to each level consumer of the products of the educational process.

The preceding issues are questions to be answered and related to the concerns regarding the educational process and accountability. This study allows the participants in this nursing education program to be

accountable for all those behaviors specified as competencies and can demonstrate that they indeed were acquired by the learner and applied by the learner in clinical field placements during the first four academic quarters of his nursing education.

One of the stated assumptions regarding this study was that the concerns of nursing education are the concerns of education in general and professional education in specific. It follows then that the findings from this study have relevance for education in general and for professional education where field application is not only important but essential. The author would encourage attempts at replication of these findings in areas of education other than nursing.

APPENDIX A

DESCRIPTION OF NURSING PROGRAM

NURSING PROGRAM

The Nursing program is a self-pacing career ladder which prepares the student for three levels of participation in the science of nursing. Commensurate with each level, students are prepared to deliver precise nursing care services and to provide effective interim management for the ill person. He will learn specific concepts and behavioral skills for teaching man to manage his own internal and external environment as it pertains to health. The two year program provides three career options. At the end of two terms the student receives a certificate as a nurse assistant. At the end of four terms the student receives a certificate and qualifies for licensure examination for Practical Nurse. Upon completion of eight terms, the student receives an Associate of Science degree and is eligible for the R.N. examination.

FIRST YEAR

FIRST QUARTER			CR
BI	231	Elem. Human Anat. & Phys.	4
PSY	207	Seminar: Human Behavior	3
NSG	101	Nursing Science Skills 1	4
NSG	106	Intro. to Nursing Science	6
			17

SECOND QUARTER			CR
BI	232	Elem. Anat. & Phys.	4
WR	121	English Composition	3
		or	
ENG	10	Communication Skills	
NSG	102	Nursing Science Skills 2	4
NST	116	Nursing for Acute Physical & Environmental Situations	6
			17

THIRD QUARTER			
FL	225	Child Development	3
SOC	204	General Sociology	3
NSG	103	Nursing Science Skills 3	5
NSG	117	Nursing for Special Care Environments 1	6
			17

FOURTH QUARTER - OPTION 1			
PSY	201	General Psychology	3
NSG	118	Nursing in Extended Care Situations	12
			15

FOURTH QUARTER - OPTION II			
PSY	201	General Psychology	3
SOC	214	Sociology of Medicine	3
NSG	209A	Practicum: Home Care & Family Participation	4
			10

SECOND YEAR

FIRST QUARTER (Term V)			CR
BI	234	Microbiology (Elem.)	4
PSY	208	Seminar: Functional Analysis of Human Behavior	3
NSG	201	Advanced Nursing Science Skills	5
NSG	214	Nursing for Community Situations	6
			18

SECOND QUARTER (Term VI)			CR
PSY	203	General Psychology	3
BI	233	Elementary Anatomy & Physiology (Pathology)	4
NSG	202	Nursing Diagnostic Skills	5
NSG	216	Nursing for Acute Physical & Environmental Situations 2	6
			18

THIRD QUARTER (Term VII)			
PSY	209	Practicum: Changes in Human Behavior	3
NSG	217	Nursing for Special Care Environments 2	6
NSG	209B	Practicum: Nursing Team Intervention	2
NSG	218	Nursing for Terminal Situations	6
			17

FOURTH QUARTER (Term VIII)			
NSG	207	Seminar: Nursing Elective	3
NST	209C	Practicum: Nursing Elective	9
			12

COURSE DESCRIPTIONS

NSG 101 NURSING SCIENCE SKILLS I (2 Class, 6 Lab Hrs/Wk) CREDITS 4

Facts, findings, and theory from basic physical, biological and behavioral sciences for conceptual understanding of those nursing skills necessary to health assessment, hygiene, and environmental safety.

Laboratory is for demonstrated competence in both skill acquisition and skill maintenance at proficient rates. The college laboratory will be used.

NSG 102 NURSING SCIENCE SKILLS II (2 Class, 6 Lab Hrs/Wk) CREDITS 4

Facts, findings, and theory from basic physical, biological and behavioral sciences for conceptual understanding of those skills necessary to adjustment before, during and nearing discharge from an acute care facility. This includes skills necessary to the assessment of illness and the care of persons confined to bed and the illness environment.

Laboratory is for demonstrated competence in both skill acquisition and skill maintenance at proficient rates. The college laboratory and Woodland Park, Gresham, and Providence hospitals will be used.

NSG 103 NURSING SCIENCE SKILLS III 92 Class, 9 Lab Hrs/Wk) CREDITS 5

Facts, findings, and theory from basic physical, biological and behavioral sciences for conceptual understanding of those skills necessary for sustaining life by the use of extraordinary internal and/or external environmental means.

Laboratory is for demonstrated competence in both skill acquisition and skill maintenance at proficient rates. The college laboratory and Woodland Park, Gresham, and Providence hospitals will be used.

NSG 106 INTRODUCTION TO NURSING SCIENCE (3 Class, 9 Lab Hrs/Wk)CREDITS 6

Introduction to the role of the nurse in society and in health and illness environments. Conceptualization of the nurse as a facilitator for the development and maintenance of maximum human potential and freedom as it pertains to health. Beginning conceptual skills to analyze and synthesize facts, findings, and theory from basic physical, biological, and behavioral sciences together with nursing skills for the practice of nursing as a precise science.

NSG 106 (Cont'd.)

Laboratory is to provide sufficient practice in the use and maintenance of these beginning skills in plans and work with persons in normal health environments and in extended care facilities. The outpatient and minimal care patient units, Previdence Hospital's extended care, minimal care units at Gresham and Woodland Park Hospitals, and selected homes for the aged and for retarded children will be used.

NSG 116 NURSING FOR ACUTE PHYSICAL AND ENVIRONMENTAL SITUATIONS I
(3 Class, 9 Lab Hrs/Wk) CREDITS 6

Concepts to analyze and synthesize facts, findings, and theory from basic physical, biological, and behavioral sciences, together with nursing skills to plan precise nursing intervention and to care for the hospitalized person of all ages.

Laboratory will be selected hospital setting for patients of all ages, and will provide proficient practice for acceleration and maintenance of nursing performance. Woodland Park, Gresham, and Providence hospitals will be used.

NSG 216 NURSING FOR ACUTE PHYSICAL AND ENVIRONMENTAL SITUATIONS II
(3 Class, 9 Lab Hrs/Wk) CREDITS 6

Concepts to analyze and synthesize facts, findings, and theory from basic physical, biological, and behavioral sciences, together with nursing skills to plan precise nursing intervention and to care for the hospitalized person of all ages. Experiences provided during this course will require multiple intervention procedures.

Laboratory will be selected hospital settings for patients of all ages, and will provide proficient practice for acceleration and maintenance of nursing performance. Woodland Park, Gresham, and Providence hospitals will be used.

NSG 117 NURSING FOR SPECIAL CARE ENVIRONMENTS I (3 Class, 9 Lab Hrs/Wk)
CREDITS 6

Concepts to analyze and synthesize facts, findings and theory from basic physical, biological, and behavioral sciences, together with nursing skills to plan precise nursing intervention to care for the person in pediatric, psychiatric, intensive care, pre and post partum, and isolated age group environments.

Laboratory will be selected special care environments and will provide proficient practice for acceleration and maintenance of nursing performance. Appropriate units at Woodland Park, Gresham, and Providence hospitals and selected community homes and organization for persons in special care environments used.

NSG 217 NURSING FOR SPECIAL CARE ENVIRONMENTS II (3 Class, 9 Lab Hrs/Wk)
CREDITS 6

Concepts to analyze and synthesize facts, findings, and theory from basic physical, biological, and behavioral sciences, together with nursing skills to plan precise nursing intervention to care for the person in pediatric, psychiatric, intensive care, pre and post partum, and isolated age group environments. Experiences provided during this course will require multiple intervention procedures.

Laboratory will be selected special care environments and will provide proficient practice for acceleration and maintenance of nursing performance. Appropriate units at Woodland Park, Gresham, and Providence Hospitals and selected community homes and organizations for persons in special care environments will be used.

NSG 118 NURSING IN EXTENDED CARE SITUATIONS (6 Class, 18 Lab Hrs/Wk)
CREDITS 12

Concepts to analyze and synthesize facts, findings, and theory from basic physical, biological, and behavioral sciences, together with nursing skills to plan precise nursing intervention for persons whose specific situation requires plans for extended care in a health care institution and/or at home and in the community.

Laboratory will be selected hospital, special care, and extended care facilities and will provide proficient practice for acceleration and maintenance of nursing performance. Selected experiences in Woodland Park, Gresham Community and Providence hospitals, as well as community homes and organizations, will be used.

NSG 201 ADVANCED NURSING SCIENCE SKILLS (2 Class, 9 Lab Hrs/Wk)
CREDITS 5

Facts, findings and theory from basic physical, biological, and behavioral sciences for conceptual understanding of those nursing skills necessary for complex diagnostic test preparation and for electronic monitoring.

The college laboratory and Woodland Park, Gresham, and Providence hospitals will be used.

Laboratory is for demonstrated competence in both skill acquisition and skill maintenance at proficient frequencies.

NSG 218 NURSING FOR TERMINAL SITUATIONS (3 Class, 9 Lab Hrs/Wk) CREDITS 6

Concepts to analyze and synthesize facts, findings and theory from basic physical, biological and behavioral sciences, together with nursing skills to plan precise nursing intervention for effective care of persons confronted with irreversible conditions, illnesses, and/or death.

Laboratory will provide selected situations in a variety of environmental settings for acceleration and maintenance of nursing performance. Woodland Park, Gresham Community and Providence hospitals, homes for aged, and family homes will be used.

Wr 121 ENGLISH COMPOSITION (3 Class Hrs/Wk) CREDITS 3

A study of expository writing with special attention to the development of unified themes designed to examine the ways in which language functions in contemporary society.

The course is specifically designed for able writers or for English majors who would profit from intensive study.

NSG 202 NURSING DIAGNOSTIC SKILLS (2 Class, 9 Lab Hrs/Wk) CREDITS 5

Facts, findings, and theory from basic physical, biological and behavioral sciences for conceptual understanding of those nursing skills necessary for precise identification of behaviors both internal and external which require precise recording and intervention procedures.

Laboratory is for demonstrated competence in both skill acquisition and skill maintenance at proficient frequencies. College laboratory and Gresham, Woodland Park and Providence hospitals will be used.

NSG 207 SEMINAR: NURSING ELECTIVE (3 Class Hrs/Wk) CREDITS 3

Discussion and programming for effective nursing performance in the clinical area and setting elected by the student.

Five students is minimum enrollment for offering any specific elective.

NSG 209A PRACTICUM: HOME CARE AND FAMILY PARTICIPATION (4 Class Hrs/Wk) CREDITS 4

Family concepts and the role of the nurse in management for teaching and for prevention of illness.

NSG 209A (Cont'd.)

Experience will be provided with selected individual families and family care organizations.

NSG 209B PRACTICUM: NURSING TEAM INTERVENTION (2 Class Hrs/Wk) CREDITS 2

Concepts, skills, and experience necessary to acquire and maintain effective nursing team membership performance and to acquire nursing team leadership performance skills.

Gresham, Woodland Park and Providence Hospitals and selected community organizations will be used.

NSG 209C PRACTICUM: NURSING ELECTIVE (24 Lab Hrs/Wk) CREDITS 9

Discussion, programming and clinical learning to accompany seminar in nursing elective.

Clinical experience consistent with his future career plans will be located by the individual student participant.

Woodland Park, Gresham Community and Providence hospitals as well as other locations selected by the student will be used.

NSG 214 NURSING FOR COMMUNITY SITUATIONS (3 Class, 9 Lab Hrs/Wk) CREDITS 6

Concepts to analyze and synthesize facts, findings, and theory from basic physical, biological and behavioral sciences, together with nursing skills to plan precise nursing intervention and to care for persons with health or illness behaviors who receive care in a community care situation.

Laboratory will be selected community health care organizations and facilities to provide for proficient practice for acceleration and maintenance of nursing performance.

PSY 207 SEMINAR: HUMAN BEHAVIOR (3 Class Hrs/Wk) CREDITS 3

Teaches components of behavior and learning. Teaches common language for observing and analyzing behavior. Emphasis on measurement of behavior.

PSY 208 SEMINAR: FUNCTIONAL ANALYSIS OF HUMAN BEHAVIOR (3 Class Hrs/Wk) CREDITS 3

Teaches how to analyze behavior for knowledge of effects of change and intervention which occur due to natural or synthetic events. Emphasis on the nature of change in human behavior.

PSY 209 PRACTICUM: CHANGES IN HUMAN BEHAVIOR (3 Class Hrs/Wk)
CREDITS 3

Teaches how to plan, effect and evaluate change in human behavior in a variety of settings. Emphasis on effects of multiple changes for maximum intellectual and social development.

SOC 214 SOCIOLOGY OF MEDICINE (3 Class Hrs/Wk) CREDITS 3

The Functions, structure and significance of health institutions in a modern, changing society; the relationship of health to other aspects of life; and the impact of illness on individual role behavior, the family and referent groups; the role of the medical practitioner.

BI 231 ELEMENTARY HUMAN ANATOMY & PHYSIOLOGY (3 Class, 3 Lab Hrs/Wk)
CREDITS 4

This course is a survey of human anatomy and physiology. It includes consideration of total body organization and primary tissue organization and function. Certain basic cell functions including body chemistry and genetic factors and each body system as a separate concern are also considered. Not sequential. Prerequisite: recent college biology or AH 11 and AH 11A.

BI 232 ELEMENTARY HUMAN ANATOMY & PHYSIOLOGY (3 Class, 3 Lab Hrs/Wk)
CREDITS 4

This anaotmy and physiology includes a more detailed consideration of total body organization. It includes cell physiology and anatomy, tissue organization and function and functional genetic factors. Several body systems will be studied, including the cardio-vascular, digestive, respiratory, and excretory systems. Not sequential. Prerequisite: recent college biology or AH 11 and AH 11A.

BI 234 MICROBIOLOGY (ELEM.) (3 Class, 3 Lab Hrs/Wk) CREDITS 4

A detailed study of microscopic life, including the protozoa and fungi, and with special emphasis on bacteria. Preparation of cultures, learning the use of the various laboratory techniques, the relationship of microbes to health and disease. Not sequential. No prerequisite.

PSY 201 GENERAL PSYCHOLOGY (3 Class Hrs/Wk) CREDITS 3
203

Basic principles and theories of behavior. Discussion of individual differences, intelligence, aptitude, methods of psychological measurement and testing, drives and motives, emotions and reactions to stress, perception, learning,

PSY 201 (Cont'd.)
203

thinking, reasoning, personality; the response mechanism, communication processes, attitudes and social processes.

ENG 10 COMMUNICATION SKILLS (3 Class Hrs/Wk) CREDITS 3

Designed to improve the student's ability to employ effectively and with increasing self-confidence the four basic communication skills: reading, speaking, listening and writing. As a foundation for these the student is helped to understand the thinking process and to analyze the interpersonal involvement that dominates the skills. Prerequisite: Passing scores in English section of the placement test or successful completion of WR 11.

SOC 204 GENERAL SOCIOLOGY (3 Class Hrs/Wk) CREDITS 3

The basic findings of sociology concerning the individual, culture, group life, social institutions, and facotrs of social change.

FL 225 CHILD DEVELOPMENT (3 Class Hrs/Wk) CREDITS 3

The infant and yound child; observations in nursery school.

BI 233 ELEMENTARY HUMAN ANATOMY & PHYSIOLOGY (Pathology) CREDITS 4
(3 Class, 3 Lab Hrs/Wk)

A survey of the fundamental nature of disease; etiology, pathogenesis, homeostatic mechanisms, regressive and progressive tissue changes.

Some Sample Course Behaviors

1. Applies the following concepts in the laboratory related to communication techniques:

   A. Paraphrases correctly 5 times in 10 minutes
   B. Validates correctly 5 times in 10 minutes
   C. Summarizes correctly 5 times in 10 minutes
   D. Infers correctly 5 times in 10 minutes
   E. Reflects correctly 5 times in 10 minutes

2. Applies concepts and skills related to drug therapy

   A. Calculates mathematical problems dealing with fractions, decimals, percentage, ratio, proportion correctly 10 times per minute with no errors
   B. Converts weights and measures into metric, apothecary and household equivalents correctly 20 times per minute with no errors
   C. Computes problems dealing with solutions and dosages correctly 10 times per minute with no errors
   D. Computes children's and infant's doses correctly 10 times per minute with no errors
   E. Interprets abbreviations in common use correctly 20 times per minute with no errors
   F. Interprets written medication orders correctly 10 times per minute with no errors
   G. Prepares, administers and records oral medications correctly once per five minutes with no errors
   H. Applies techniques for administering intramuscular injections correctly once per six minutes with no errors
   I. Applies techniques for administering subcutaneous injections correctly once per six minutes with no errors
   J. Applies techniques for administering intradermal injections correctly once per six minutes with no errors
   K. Applies correctly and/or states use of drops, ointments, solutions in drug therapy correctly once per six minutes with no errors
   L. Applies correctly and/or states safety measures used when preparing and administering medications correctly whenever applied with no errors

3. Applies concepts and skills related to oxygen therapy

   A. Lists indications for oxygen therapy correctly 10 times per minute with no errors
   B. Applies techniques for mouth-to-mouth resuscitation for children and adulst correctly 20 times in 10 minutes with no errors
   C. Applies nasal catheter, mask and nasal cannula for oxygen therapy correctly 3 times per 10 minutes with no errors

APPENDIX B

SAMPLE COURSE BEHAVIORS

D. Describes in writing use of oxygen tent, and croupette correctly 10 times per 2 minutes with no errors
E. Administers IPPB treatment correctly once per 15 minutes with no errors
F. Uses oxygen tank, wall outlets, regulatros and flowmeters correctly 4 times in 20 minutes with no errors

4. Applies concepts and skills related to the care of the tracheostomized patient

A. Writes characteristics of two types of tracheostomy tubes correctly 5 times per 2 minutes with no errors
B. States clinical situations in which tracheostomy may be necessary correctly 10 times in 2 minutes with no errors
C. Applies tracheostomy care in simulated patient situation correctly once per 20 minutes with no errors
D. States or writes emergency actions relative to the patient with tracheostomy correctly 10 times per 2 minutes with no errors

5. Applies concepts and skills related to team nursing

A. Writes and does Is-Did plans weekly on each assigned patient
B. States the philosophy of team nursing correctly once per 2 minutes with no errors
C. Writes or states the competencies and needs of the various health workers on the nursing team correctly 10 times per 2 minutes with a minimum of one error
D. States the aims of supervision correctly 10 times per 2 minutes with no errors
E. Discusses the issues of the organizational structure of supervision correctly 15 times per 3 minutes with no errors

6. Applies clinical competencies

A. Remains silent with selected patient for five minutes
B. Maintains eye contact with patient during two separate ten minute conversational episodes.
C. Pinpoints correctly behaviors which infer anxiety in at least ten separate patients. Writes and/or says these pinpoints with instructor present with student and patient.
D. Pinpoints correctly behaviors which infer fear in at least ten separate patients. Writes and/or says these pinpoints with instructor present with student and patient.
E. Pinpoints the behaviors of five (one being the student's assigned patient) separate "psychiatric" patients and infers their diagnosis correctly.
    1. Substantiates the existence of each pinpointed behavior with 2 days of frequency data.
    2. Puts data on daily behavior charts
    3. Validates in writing and with data whether these frequencies fall within the range of "normal". Due April 16, 1973

F. Takes at least one of the pinpointed behaviors of an assigned patient and develops and implements an Is-Did. Behavior should clearly celerate toward desired goal. Due April 26, 1973
G. Teaches an assigned patient to count, chart, and change at least one pair of behaviors. Due April 12, 1973
H. Conducts at least one patient-staff-student workshop. Format to be discussed with instructor at least two days before workshop date. Due as per signed up
I. Verbally identifies signs of normal and abnormal aging processes in assigned patients. Due before April 13, 1973
J. Points and verbally states variable factors in patients' environment which prevent optimum physical and mental functioning and implements actions to reduce or eliminate such.
K. Develops at least one in-depth personal history from a patient of choice, and, in class, verbally relates to at least two different psychological theories of aging discussed in class. Present May 29, 1973

1st Year Nursing Program Product Behaviors To Be Counted

	Behavior	Behavior Setting	Time Sample
1.	Judges Interpersonal Contacts sensitive	All places	600"
2.	Judges Interpersonal Contacts insensitive	All places	600"
3.	Applies learned nursing skills correctly	All places	600"
4.	Applies learned nursing skills Learning Opportunities	All places	600"
5.	Applies learned concepts correctly	All places	600"
6.	Applies learned concepts Learning Opportunities	All places	600"
7.	Makes faculty contacts	All Nsg. Faculty	600"
8.	Makes student decisions	All places	600"
9.	Makes positive class contributions	Nsg. Classes	300"
10.	Makes Learning Opportunities class contributions	Nsg. Classes	300"
11.	Teaches patient correctly	Lab	540"
12.	Teaches patient Learning Opportunities	Lab	540"
13.	Gives personalized nursing care	Lab	540"
14.	Gives depersonalized nursing care	Lab	540"
15.	Feels positive about patients	Lab	540"
16.	Feels negative about patients	Lab	540"
17.	Feels positive about nursing program	All places	1000"
18.	Feels negative about nursing program	All places	1000"
19.	Feels positive about peers	All places	1000"
20.	Feels negative about peers	All places	1000"

APPENDIX C

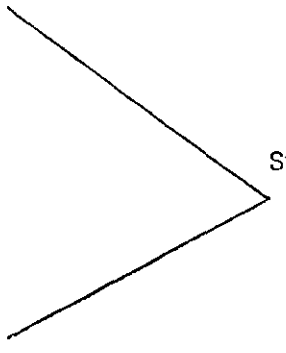
EXAMPLES OF NURSING PROGRAM PRODUCT BEHAVIORS

	Behavior	Behavior Setting	Time Sample
21.	Feels positive about nursing care I give	All places	1000"
22.	Feels negative about nursing care I give	All places	1000"
23.			
24.			
25.	Student choices in concert with clinical advisor		
26.			
27.			
28.			

2nd Year Nursing Program Product Behaviors To Be Counted

	Behavior	Behavior Setting	Time
1.	Applies Interpersonal Relations skills in which the other person has been taken into account in a sensitive manner	All places	For all behaviors, student choice of 100", 300", 600", or 1000" Time Samples
2.	Applies Interpersonal Relations skills in which the other person has not been taken into account in a sensitive manner	All places	
3.	Applies learned nursing skills correctly	All places	
4.	Applies learned nursing skills Learning Opportunities	All places	
5.	Applies learned concepts correctly	All places	
6.	Applies learned concepts Learning Opportunities	All places	
7.	Teaches patient correctly	Lab	
8.	Teaches patient Learning Opportunities	Lab	
9.	Gives personalized patient care	Lab	
10.	Gives depersonalized patient care	Lab	
11.	Feels positive about patients	Lab	
12.	Feels negative about patients	Lab	
13.	Feels positive about nursing program	All places	
14.	Feels negative about nursing program	All places	
15.	Feels positive about nursing care I give	All places	
16.	Feels negative about nursing care I give	All places	

Behavior	Behavior Setting	Time
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		
25.		
26.		
27.		
28.		



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