The University of Manitoba

AN EVALUATION OF THE SIMULATION OF MULTIPLE HANDICAP BY STUDENT NURSES AS AN IN-WARD CLINICAL TEACHING STRATEGY

by

John Kellie

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ABSTRACT

Three teaching strategies designed to improve nursing care given to multiply handicapped patients by psychiatric nursing students were evaluated in a series of experiments using a single-subject design. The strategies were normally applied as a package within a four or five week clinical nursing practice experience in an institutional ward-setting. The first procedure was firm instructions to the subjects and two-role reversal procedures which required the subject to spend one day simulating the role of a hemiplegic patient in a wheelchair and one day simulating a patient with a quadriplegia. The procedures involved physically restricting the students limbs and disallowing communication in speech. Thus, the subjects were highly dependent on others for their care needs, including nutrition and hygiene.

The dependent measures were three classes of nursing care responses given by each subject to their assigned patients in the phases that followed exposure to each of the three treatment variables. Observations were made primarily by the subject's peers who were coincidentally gaining clinical experience in the same setting. The observations were made covertly using a momentary time-sampling method.

Four experiments were conducted, and each consisted of an initial experiment which was followed by up to three replications. The replications were similar but not identical as they contained systematic variations. The first independent variable of instructions was applied following a no-treatment or "analytic" baseline and was followed by the "wheelchair" and "mat" role reversal procedures in ABCD, ABDC, AB, AC, and AD designs. Instructions were also applied on the first day to establish a "normative" baseline which was congruent with normal use in

BCD, BDC, B, BC, and BD designs. Two subjects were used in parallel in each experimental replication.

The results suggested that the strategies were effective in increasing correct response rates across subjects and dependent variables when applied as a package. Instructions and the mat procedure were invariably followed by increases in response rates, with the "mat" associated with the highest rates regardless of the order of application. The effects of the wheelchair were less clear and less distinct except when applied as a single variable in the AC design. Instructions were clearly effective in inducing higher response rates when used as a single variable in the AB designs, but durability of the results was not always evident following the use of a single variable in the AB designs. The mat procedure on the other hand, was invariably followed by the highest response rates which showed durability over time in all instances of use.

INTRODUCTION

The objective of this study was to evaluate a strategy for improving care given by student nurses in a ward setting as part of their learning experience. This aspect of nursing education is usually called clinical practice and is gained with patients in a work setting following academic instruction and laboratory rehearsal. The clinical learning is planned and guided by an experienced nurse-teacher and proceeds along a continuum from a fully supportive point towards independent performance.

Practical competence is demanded in any applied discipline but in nursing and other health sciences it is critically important as deficiencies in skills are potentially harmful to the health and welfare of the client. The responsibility of a school of nursing for the clinical competence of its graduates becomes apparent from a review of the registration process which enables a person to practice as a registered nurse in Manitoba. A graduate of a school approved by regulations under the Manitoba Association of Registered Nurses Act (1981) is recommended as a competent candidate for examinations held under the auspices of the Manitoba Association of Registered Nurses. The current examinations are set by the Canadian Nurse Association Testing Service, and contain only objective computer scored items. Thus, applied skills are not tested directly by the professional organization which extends the legal right to practice to all successful candidates. A similar process occurs with registered psychiatric nurses under separate legislation of the Registered Psychiatric Nurses Act (1981) and with licensed practical nurses under the Licensed Practical

Nurses Act (1981). Thus, the responsibility for the practical competence of the newly graduated nurse rests squarely with the school.

A major shift in the responsibility for nursing education occurred in the nineteen seventies when the majority of diploma nursing programmes moved from their traditional locus in the health care system to junior and community colleges. This also involved a shortening of the length of the programmes from three years to two years, and was predicated on the introduction of clear cut and limited objectives. The philosophy was markedly "technical" as opposed to a more general and "professional" philosophy embraced by baccelaureate programmes in the universities. The move followed extensive criticism regarding the quality of existing diploma schools sponsored by hospitals and has been extensively discussed in the literature (see for example: Brown, 1948; Ginzberg, 1948; Montag, 1951, 1959, 1980; The National Commission to Study Nursing and Nursing Education, 1970; Alberta Task Force on Nursing, 1976; Manitoba Association of Registered Nurses, 1976, and The Manitoba Task Force on Nursing Education, 1977).

Unfortunately the move into the educational sector has not been the expected panacea, and a ground swell of criticism of the two year programmes has occurred. According to Martin and McAdory (1977) the most vocal critics are the directors of nursing in hospitals. Although much of the criticism appeared to be directed towards the location of education away from the workplace Ciciatello (1974) stressed insufficient theory together with an insufficient length of clinical experience necessary to translate theory into practice as major factors. Bensman (1977) noted that at that point in time, over three hundred two-year programmes had been lengthened. However, she interpreted this

not as a negation of the assumption that a nurse could not be prepared in two years, but as losing sight of the "technical" philosophy with its limited terminal objectives.

Support for the inadequate length of clinical experience as opposed to the location of programmes viewpoint occurred in Manitoba where community college and hospital two-year schools co-exist. The Manitoba Task Force found criticisms of two year graduates to be a recurrent theme, and particularly noted that the Manitoba Hospitals Inc. charged that the graduates were inadequately prepared, and firmly identified the deficiency as inadequate clinical experience. Paradoxically, the University of Manitoba four-year baccalaureate graduates also received similar criticism for their in-hospital performance. Although this appears to be a contradiction of the insufficient length of time argument, there is little difference between the Red River Community College and the University of Manitoba in actual clinical experience in the "technical" spheres of bed-side nursing. The Manitoba Task Force further noted that the registered psychiatric nurses and the licensed practical nurses were exempt from such criticism. However, the programme and agenda for Psychiatric Nurses Association of Manitoba annual meeting, info (1983), contained a resolution addressed to similar concerns. Thus, a perception of inadequate clinical performance of nurses in hospitals appears to be widespread and not solely associated with one particular type of programme.

The perceived inadequacies of clinical performance are a just and proper concern of the professional nursing educator, and although extended experience may be desirable, it may not be feasible in terms of economics and established programmes. One solution may be the

improvement of clinical teaching through innovative experiences and strategies. As Benner (1982) comments, "it is impossible to learn ways of being and coping with illness solely by theorem and concept". Thus, there appears to be a need for strategies which go beyond teaching basic cognitive and psychomotor skills in that they need to induce a transfer of skills into effective coping with human needs in a demanding work environment.

A strategy directed towards such ends was introduced by the author in a diploma programme in psychiatric nursing at the Manitoba Developmental Centre in Portage la Prairie, Manitoba. The strategy was patient simulation consisting of two role reversal experiences in which the student adopted the role of a multiply handicapped individual within an actual ward setting.

The remainder of this paper will discuss simulation and the specific role reversal techniques and certain problems relating to their evaluation, the identification of a third variable among the instructor's teaching strategies, the nature of the problem, the selection and development of the experimental methodology used to evaluate the strategies, a description of the experimental method, and the presentation and discussion of the results. The literature is progressively reviewed within the context of the discussion.

REVIEW OF THE LITERATURE

A teaching strategy that may help to facilitate transfer from theory into practice is simulation, which according to Dale (1969) is second only to direct experience in terms of concrete participation. Simulation is a contrived experience, and according to Cooper (1979) "is the creation of a situation that mimics conditions that occur in real life". The simulator need not be animate and well-known examples are flight simulators used in training pilots and the dummy used for cardio-pulmonary resuscitation practice. Games also have a place in simulation and according to Wolf and Duffy (1979) induce the participant to make cooperative or competitive decisions. Role playing, according to Cooper (1979), is a form of simulation where one person simulates the role of another, and this is commonly used in health science teaching where the actor frequently simulates a patient. Typical proponents of this method are Barrows (1978), Maatch, Jack, and others (1978), Lincoln, Layton, and Holdman (1978), Cooper (1979) and Davidhazor (1979). Although the actor may gain knowledge the targeted learner is the individual acting upon the role player.

An alternate use of role playing is directed towards the actor gaining the benefit. This is not solely an academic tool but has extensive use in problem solving, counselling, and psychotherapy. The main uses appear to be directed towards gaining awareness and insight, experimenting with alternate roles and constructions in a safe climate, clarifying ones own role, and changing attitudes. Many such uses are given in well-known texts such as that of Stuart and Sunden (1983), The Principles and Practice of Psychiatric Nursing and it is the central theme of Moreno (1946) in Psychodrama. Role playing is commonly used in

vocational and business courses, as for example, in teaching interviewing and sales and service techniques. Farrell, Hayley, and Magnasco (1977) used similar methods of simulation in teaching interpersonal relationships to student nurses.

Role reversal is advocated as a counselling strategy by Hackney and Nye (1973). However, role reversal shows possibilities beyond counselling as was demonstrated by Rosenham (1973) in an experiment in which six professional psychologists and doctors, plus two lay persons, played the part of psychiatric patients and succeeded in getting themselves admitted to a mental hospital and treated for schizophrenia.

An abbreviated role reversal technique was used as a possible method of increasing awareness and performance of diploma psychiatric nursing students gaining clinical practice with severely and multiply handicapped patients at the Manitoba Developmental Centre in Portage la Prairie. A concern of the author was that the students who were functioning for part of the day outside his direct supervision would adapt to the ward norms of care. These were mainly directed towards immediate short-term goals, as for example, the need for feeding a given number of patients in a specified time. Consequently, methods of feeding were expedient rather developmentally oriented. Communication levels were low and patients needs were often anticipated rather than a result of receptive communication. Posturing and positioning were related more to comfort and safety than to the more active needs of physical rehabilitation. Day-to-day nursing care was usually given by aides or other ancillary staff who lacked not only a conceptual understanding of the precepts of development and rehabilitation, but were also denied the reinforcement of seeing obvious improvement of

their patients. Additionally, some ward staff members were often off-task, or "taking a breather", a behaviour which appeared to generalize to some students. Many positive aspects of exercise therapy, communication, and maintenance of nutrition and health existed, and appeared to be continually but slowly improving. However, the head nurse and staff nurses were caught in a double bind situation of immediacy versus long-term goals, which is perhaps characteristic of low budget institutions which frequently do not have an ideal staff-patient ratio. However, the staff were in general regarded as progressive and anxious for improvement. Kindness was not lacking in the auxilliary nursing staff but their failure to move beyond expedience may be associated with limited perception. Indeed, Rosenham suggests that in institutions the perceptions of staff may be influenced more by the actual situation than by their disposition.

Be that as it may, the nursing instructor was faced with the problem of elicitating higher-order care behaviours based upon the principles of development and the promotion of habilitation, in a situation where expediency was the norm. Previous experience with individuals suffering from severe and critical conditions had often exposed the instructor to comments such as "... but you can't understand if it hasn't happened to you!". This type of statement plus familiarity with situations in which therapists are frequently those who have experienced particular states, as for example alcoholism and amputation, suggested to the instructor that student experience as a patient might prove useful in promoting empathy and gaining insight into the psychological and personal discomfort problems experienced by the severely handicapped. There was an inherent but unstated assumption

that such gains would be translated into better nursing care. This assumption was by no means unreasonable as empathy is held by some to be an important therapeutic change agent and a key to forming helpful relationships. (Kalisch, 1971; Stewart and Sundeen, 1983, p.90; Rogers, 1975). Thus, two "experiential projects" were introduced which required that all students adopt the role of a handicapped person within the ward setting of Parkhaven. It should be emphasized that these assignments were not designed for experimental purposes but introduced as clinical teaching strategies.

These two strategies were essentially patient simulation or role-reversal techniques, and were directly related to two subgroups of patients. One group was totally dependent, with little motor activity except for the pathology of spasticity and athetosis. None of the members of this group could sit unaided or contribute towards self-feeding except in a rudimentary way. None could speak or communicate with symbols, but all could make eye contact, and made responses to questions and sensations of comfort and discomfort. Visual and auditory perceptual defects were present in all, but only one was completely blind or deaf. Most showed physical signs of spending long periods on their backs as evidenced by extension of the shoulders and a failure to develop natural spinal curvatures. They were all receiving some degree of physiotherapy but their general milieu was limited to the ward and adjacent environments, mobility being limited to short periods in wheelchairs which they could not push. None were tentatively assessed as higher than severely retarded in the language of the American Manual on Terminology and Classification on Mental Retardation (Grossman, 1973).

The assignment relative to understanding the needs of this group, required that the student spend the day on a mat in Parkhaven in company with severely handicapped patients. A quadriplegia was simulated by splinting the elbows and knees of the student and no verbal communication was allowed. The student "patient" was fed flat and all care needs, including toileting, were performed by a student nursing care "buddy" (a visit to the toilet was permitted but he or she had to be taken and the handicapped condition continued). A written account of the experience was required from the student immediately following the conclusion of the experience.

The second group of patients were less impaired physically and intellectually. Most could use their arms and hands with difficulty and could manage, or be managed, in wheelchairs. They could contribute towards self-feeding, and elimination needs were generally self-perceived but not always manageable. Perceptual defects were present. Only two could speak, and one was virtually blind. Communication was by listening, and responding by Bliss Symbolics (Bliss, 1965), or word or alphabet boards, or by pointing. All received physiotherapy and visited a sheltered workshop. Outside trips were arranged but the patient was frequently confined to the ward or adjacent areas. Frustration responses occurred when needs were not met or not perceived.

The assignment relative to understanding this group required that the student spend the day in a wheelchair with the dominant arm and leg splinted to simulate a hemiplegia. Moreover, conditions of blindness were established through the morning but were discontinued after lunch. The student was allowed to feed himself with his non-dominant hand

whilst still blindfolded. Toiletting and hygiene were similar to those of the mat experience although the student could propel herself to the toilet.

The Manitoba Developmental Centre students, plus students from two other schools who gain part of their experience in the same area, experienced one or both projects which were assessed positively by almost all participants. However, no specific evaluative tools were established except for a short account of the experience, and the objectives of the assignment were couched in terms of the students' reactions rather than clinical performance. Virtually all written accounts suggested that the experience had a marked emotional effect, and that there were gains in empathy and insight. However, this should have been confounded by the demand characteristics of the assignments.

In general, the simulated quadriplegic experience with the student lying helpless on a mat appeared to be the more disturbing. The student reported that noise levels were very high, fellow students and others did not speak to them often enough, they became sore and stiff, feeding was invariably too quick, and thoughts of soiling themselves provoked some anxiety. Many appreciated the touch of an adjacent patient although they found them smelly. In general the wheelchair experience appeared to have less effect emotionally but appeared to provoke more open frustration. In both assignments, food soiling the subject's faces, and fluids dribbling down their front were regarded as distasteful and irritating.

Evaluation of the strategies had been limited to scrutiny of the written assignments required from each student. Thus, if these strategies were to be applied in a sound educational design they must

necessarily be subjected to evaluation in which measurement is a prime requirement (Houle, 1972, p.42). Evaluation of the strategies as a means of increasing clinical competencies would have been difficult if the instructors objective of increasing empathy had been accepted as the criterion. Previously it was noted that there appeared to be an inherent assumption in the assignments that empathy would increase and as a consequence student performance would improve. Such an assumption in nursing is not uncommon and Lamonica, Carew, Winder, Haase and Blanchard (1976) proposed that there was a need to study empathy in nursing as they "found nurses empathy scores to be low". Humanistic psychologists such as Carl Rogers (1957, 1973) share the instructors assumption and regard empathy as a core condition of helping relationships.

Many definitions of the emotion of empathy exist with perhaps Northouse (1979) providing the simplest; he writes that "empathy is the process where one person attempts to feel and think the same way as an other". There appears to be a paucity of research of empathy as a cause of behaviour, and it receives no attention as a possible motivator by Beck (1978) in his book Motivation: Theories and Principles. Although Hoffman (1976) firmly supports empathy as a basis for morality, and Coke, Batson, and Davies (1978) state that increasing empathetic arousal in subjects raises the likelihood that they will help others, Wrightsman and Deux (1981, p.258) conclude only that the research suggests that there may be an emotional basis for some kinds of helping behaviours. Indeed the majority of research reports on empathy do not appear to be directed towards its role as a causal agent but rather towards topics such as its measurement (Hobart and Fahlberg, 1965; Hogan, 1969; Kurtz

and Goumon, 1972), its relationship with other personality variables (Dymond, 1948; Henderharn, 1962; Northouse, 1979), understanding others (Cronbach, 1955), and its training and acquisition (LaMonica and others, 1976; Kalisch, 1971). The term insight was also linked to empathy in the objectives. The intended use was obviously directed towards the perception of the states of others rather than self. Breen and Glass (1977) linked insight and empathy together with interpersonal relationships as important characteristics in the successful nurse, but as a criterion for the study of strategies designed to increase clinical competencies, insight would appear to have limitations similar to those of empathy.

Writers such as Mischel (1971) have challenged the causal role of cognitions and internal concepts without recourse to stimulus conditions, and Foreyt and Rothjen (1978) point out that feelings are not necessarily translated into behaviour. The radical behaviourist school would reject the necessity to consider insight and empathy as causes of subsequent changes in student behaviour following the students behavioural experiences. As Skinner (1971) writes in Beyond Freedom and Dignity:

> We do not need to try to discover what personalities, states of mind, feelings, traits or character, plans, purposes, intentions, or other prerequisites of autonomous man really are in order to get on with a scientific analysis of behaviour.

The relationship between the strategies applied and changes in student behaviour, would seem to be more useful information to the nursing educators and administrators who have shown dissatisfaction with the clinical performance of new graduates rather than their emotive

state. Thus the research problem was stated in these terms without recourse to the constructs of insight and empathy.

Additionally, an examination of the instructors practices showed that a firm statement of expectations or instructions was given by the instructor in addition to a routine orientation to the clinical practice area by ward staff. Bandura (1969, p.242) states that much of the research indicates that instructions are not an effective agent of behaviour change unless they specify the consequences of following or not following the instructions. Although consequences were not stated by the instructor in the present case, they were implicit and perhaps relatively strong when they were linked to the on-going evaluation system on which the students progress depended, and which traditionally demand compliance. The instructor was also differentiating role performance with norms more idealistic than those operating in the environment. A possible conflict between competing norms and sanctions, and between idealism and practicality (see Bendall, 1975) perhaps adds further complications to the clinical milieu. Instructions, in such a situation may be highly important and therefore was considered as an independent variable along with the two role-reversal procedures.

STATEMENT OF THE PROBLEM

The problem was to comparatively evaluate three clinical teaching strategies which were usually applied successively within a short period of time. They were designed to improve nursing care given by students to multiply handicapped young persons, and in particular when the students were not directly supervised by a clinical instructor.

The written directions for two of the strategies, which were role-reversal procedures, stated that the objectives were to gain empathy and insight into problems experienced by multiply handicapped persons. However, it is clear that the goal was to improve nursing care given to young handicapped persons by student nurses, particularly when not directly supervised by an instructor. Thus, the basic questions were, "are the strategies effective in improving performance or not, and if so, what is the relative contribution of each component?"

The evaluation was made in a complex naturalistic setting, namely an institutional ward, without disrupting the on-going educational programme of the subjects. The availability of subjects and the maximum length of the experimental periods was determined by a pre-arranged schedule for student clinical experience in the setting, which precluded random sampling and matching. Groups who progressively succeeded each other through the area were similar in that they were all in the fourth term of a six term two-year programme. They were dissimilar within each term in that each successive group had gained more education and experience than the preceding group. No consideration of isolating the subjects from this effect could be entertained for obvious academic and

ethical reasons, but further groups of subjects were available each year at the same historical point of their respective programmes.

Limitations on covert observational methodology were imposed by: lack of places of concealment; employment policies precluding electronic surveillance; the flow of staff, students, and patients from one area to another; congestion, and the problem of a rationale for the presence of anyone other than care personnel in an area with little tolerance for uninvolved bystanders. The time limitation also had implications for the selection of dependent variables as it precluded observations made in terms of patient gains.

The lack of a time or monetary commitment to research also placed limitations on the observational methodology, restricting the dimensions of possible schedules and the availability of observers. The pool of observers was limited to student nurses who were members of the same group of students as the subjects (which was by no means undesirable in regard to the need for covert observations) and to those who were willing to assist within the scope of their day to day activities out of professional interest and concern for improving patient care.

METHOD

Design

The model selected for the analysis of the problem was the "within-subject", or "single-subjects" design which Campbell and Stanley (1963, p.70) hold to be an adaptation to the study of human behaviour of one of the most basic experimental designs in science. Essentially, the subject of the study serves as his own control in that pre-treatment observations are made and a performance baseline is established. Treatment is then applied which may be a single application, or repeated applications according to a schedule, or applied as a consequence of specific behavioural responses emitted by the subject.

Semb (1976) pointed out that the design can accommodate the application of one variable, or more than one variable if applied at successive intervals. Additionally, the independent variable can be measured against more than one dependent behaviour concomittently. These characteristics appeared to be particularly useful in the case of the current study which required the application of three independent variables, and their measurement against selected dependent nursing care behaviours. Semb noted that the use of the design is relatively new in education but holds that its use of single subjects is highly useful with a special potential for revealing information about individual differences, rather than actuarial information about groups such as that provided by static group designs.

The design tends to demonstrate large shifts in behaviour rather than minor shifts that might be present statistically. Baer (1977)

noted that behaviourists who mainly use the design, tend to make very few type-one errors but a great many type-two errors, a factor which may be beneficial in the present study as the results need to be reasonably large in order to justify the use of the procedures.

The within subject design has been adopted as a core methodology of a major school of psychology, that of Behaviour Modification, which in general prefers the experimental data to be presented explicitly for visual inspection rather than as inferential statistics. Although some members of the school (Kesselman and Leventhal, 1974; Kazdin, 1976, and Jones, Vaught, and Weinrott, 1977) have advocated the use of statistics, the present study was in accordance with those who have argued that conceptual systemacity (see Baer, Wolf, and Risley, 1968) should maintain the technology which presents explicit data, a design which Michael (1974) and Baer (1977) holds to have been highly effective in the analysis of behaviour. (see also Hersen and Barlow, 1976; Martin and Pear, 1983; Hersen, Eisler, and Miller, 1975, 1976, 1977, 1978, 1978, 1979, 1980, and 1981).

The possibilities of confounding by extraneous variables is always a danger in applied and naturalistic studies. The single subject designs lessen these possibilities through the use of parallel subjects with the independent variable being introduced at a different time point. Such a strategy, along with systematic replications are held by Baer (1977) to gradually filter out extraneous variables. Campbell and Stanley, (1963, p.41) pointed out that the progressive accumulation of knowledge and experience are always a problem for replication in educational studies, and recommended that replications be with successive classes at the same time point of their respective educational

programme. Baer (1970) on the other hand argued for systematic (rather than direct) replications across subjects as the preferred method. Semb (1976) holds that replications should not be completely identical where two independent variables are used, and recommends reversing the order of the variables as being more analytic.

Single subjects designs appear to have broad applications and many examples are regularly reported in the Journal of Applied Behaviour Analysis. Komaki (1977) held that the design is particularly useful in studying organizational behaviour, and examples of use in this context appear in the Journal of Organizational Behaviour Management.

The current study relied on the design characteristics to lessen the danger of confounding by extraneous variables, and the data was presented in accordance with those who have argued for an explicit methodology. This included presentation graphically with significance being judged from visual inspection of the graphs in terms of size of effect, immediacy of effect, the number of overlapping data points in adjacent phases, and in the number of successful replications.

The design provided for three independent variables as a teaching package in one experiment (which was replicated three times) and also as three single treatments in three separate experiments (also scheduled for up to three replications each). This was done to avoid interaction effects and the possibility of control by stimuli associated with the various treatment effects that could have confounded the analysis when all three independent variables were used. Subjects were used in parallel, and three independent behaviours were measured, thus, the design used a multiple baseline across behaviours and across subjects (see Martin and Pear, 1983, pp. 338-340).

A no-treatment baseline was used in half of each experimental series in order to fully analyse the effect of the first variable to be applied. Although this was analytically sound technology it created an uncharacteristic element of anomy among the subject students. Thus, in half of the experiments, the first variable of firm instructions was given on the first day in order to reproduce the naturalistic use with exactitude. Thus two different and comparative baselines were used, one being a classical no treatment baseline, and one being created by the use of instructions on the first day as a naturalistic base.

When the independent variable of instructions was used with one or both role reversal procedures, instructions were applied first in accordance with their invariable natural use. However, when both role reversal procedures were used, their order of application in successive experiments was reversed or counterbalanced systematically in accordance with the suggestions of Semb (1976). The application of the independent variables was delayed or staggered in the case of each second parallel subject as recommended by Baer (1977). Three systematic replications of the initial experiments were scheduled in the fourth term in each of three successive years with successive classes of students. Thus the concern of Campbell and Stanley (1963, p.41) that replications with successive groups at identical time points was also met by the design.

Parallel subjects were also maintained in a no treatment or baseline conditions during the first experiment and its replications, which evaluated all three independent variables of the teaching package. This practice was not followed in the remaining three experiments as their objective was supplementary in nature, being to analyse further the effect of each individual variable. This was consistent with the

concepts of single subject designs, particularly when used with multiple baselines.

Initially, the length of each experiment was twenty days but this was necessarily shortened to twelve days during the second fall term of the experience due to changes in the students' programme. Fortunately, they were scheduled to gain experience in an adjacent setting with similar but older patients, and observations were continued in the second setting which rendered some information as to generalization of the responses. A further change occurred with the last group of subjects in that a similar successive experience was with younger patients at a separate institution, where it was also possible to schedule observations.

Dependent Variables

Three dependent variables were selected as being crucial to the nursing care of multiply handicapped children. These were: communication and all forms of stimulation; motor activity, including all forms of exercise and posturization; and feeding, with movement towards self-feeding being an inherent principle. The criterion of concern was the correctness or incorrectness of the responses rather than the occurrence or non-occurrence of the activity. For instance it was observed that the subjects were invariably involved in feeding at the scheduled times but often in an incorrect and expedient manner.

The choice of dependent variables was achieved through consensus among an *ad hoc* group who agreed to perform this service as they were professionally concerned with the multiply handicapped patients and met as members of a therapeutic team. The members were two graduate nurses,

one consultant physiotherapist, one physical medical specialist, one clinical psychologist, two nurse-teachers, and two student nurses.

The group considered only active care responses directed towards development and habilitation rather than maintenance behaviours such as diapering, washing, and skin care. However, it was recognized that these latter behaviours would often be necessary during the sampling times for communication and motor activity, but it was agreed that such behaviours, when occurring, should be evaluated in terms of the two variables. Although the premise of being occupied or unoccupied ("on-task" or "off-task") was not considered to be an important factor related to the evaluation of nursing care, it was considered as a source of supplementary information. This variable was eventually rejected as it proved to be impractical in actual use.

The choice of dependent variables should require little validation, and Trulove, Neave, and Cammell (1963) extensively discussed the importance of these nursing care behaviours in the same setting. The need for stimulation and communication is accepted almost as a self evident truth among professionals concerned with development and learning to the degree that much of the literature relates to the question of the relative contribution of environmental stimulation and learning (for example, see Dennis and Narjan, 1957). For an extensive evaluation of the literature see Bowlby (1957, 1960) who concluded that even writers such as Goldfarb (1949) and Spitz (1945) who have been criticized for their methodology are actually guilty of understating their case regarding the need for stimulation.

Motor activity, exercise, and posturization is central to the treatment of physical handicap in general. The lack of movement not

only effects the muscular-skeletal system but also interferes with broad physiological functioning, and is often accompanied by various psychological manifestations (Hirschberg, Lewis and Thomas, 1964, p.14-23). The symptoms of cerebral palsy include hyper-reflexibility in addition to impairment of muscular effort, thus treatment of the condition requires a careful balance between exercise and inhibition (Bobath and Bobath, 1950, 1967; Bobath, 1976; Snell, 1978). The entire thrust of Finnie (1974) stresses the need for correct handling and movement to facilitate positive functioning in a child, and in particular to avoid reinforcing faulty movement and posture which leads to permanent deformity. Delcato (1963) in a rationale for his more controversial therapy, particularly stresses the need for adequate and correct sensorimotor patterns as a basis for the development of speech and reading.

Although careful feeding practices are obviously essential to life and health in the case of helpless persons with swallowing difficulties, a cursory appraisal might not rank the process as a high order behaviour. However, feeding practices have long attracted the interest of those concerned with the emotional development of infants. These have included such diverse approaches as Sigmund Freud's intellectual constructs of the need for oral gratification (see Meisner, Mack, and Semrod, 1975, p.508) and the primate studies of Harlow and Zimmerman (1959) and Harlow and Harlow (1962) which stressed the importance of contact comfort which is normally given during the feeding process. Bavin (1978, p.18) holds that the intimate contacts that occur during the process are also a foundation of the relationship which is essential to intellectual development (presumably through the establishment of an

early social learning relationship). Thus, the ability to suck, cling, and cuddle, appear to be advantageous to the normal child. Thus, one who is not able to perform these responses appears to be at a disadvantage.

Unfortunately there are other implications for development in a child who has difficulty in swallowing or using the muscles of the tongue or face. The reflexes and other responses which are used in swallowing are also the foundation for speech. Thus, Crickmay (1966, pp.91-117) insists that an essential prerequisite for language development in the cerebral palsied child is correct feeding practices. Additionally, seemingly simple features as the line of approach of the feeder, which are relatively unimportant in the normal child, are crucial to successful feeding in children with cerebral palsy. Too high or too low an approach causes a child to tilt back or to lower his head in order to reach the food, movements which may trigger all-or-none spastic reactions and may result in a child being unable either to close or to open his mouth as these are integral parts of the extensor or flexor responses respectively. Thus, feeding in the case of multiply handicapped children requires an intelligent accommodation between the primary demands of biological survival on the one hand and the foundations for development on the other.

Performance criteria on the dependent variables were set at the conclusion of a twelve week pre-experimental trial which was designed to develop and refine the procedures. The rates were set in consultation with the care staff who arbitrarily suggested a desirable criterion of 90% correct response rates with a maximum allowable incorrect response rate on any discrete day of one unsatisfactory sample on any or each

variable. This rate was accepted as the trial data suggested it to be feasible.

Observations

The observational methodology was an adaptation of momentary time sampling which is recommended by Powell, Martindale, and Kulp (1975) as the most effective method for sampling behaviours of expected long duration. The necessity for covert observations, the absence of places of concealment, the impracticality of placing two observers in a congested care area, and the need to make observations in several rooms precluded the use of time limited sessions during which concentrated observations could be made. The procedure used approximated a "walk past" sampling method used by Brown, Willis, and Reid (1981) in a similar setting. The occurrence of behaviour or non-occurrence of behaviour in this study was recorded once during each hour by supervisors as they walked past the setting and recorded the data on a clipboard that they normally carried. The primary observers in the current study, who were fellow students of the subjects, used small file cards which slipped easily into their pockets, rather than a clipboard which would have been readily discovered by their subject colleagues. A target sampling ratio of each half hour was proposed but was found not to be feasible during a twelve week pre-experimental trial.

The trial also determined that the momentary sampling period should be extended in cases where the subject was moving between patients, hand washing, pausing to adjust themselves or their clothing, securing equipment, or recording. In cases where it was known that the subject

had been directed to perform other activities, the procedure was to resample at the first convenient opportunity.

The choice of observers was determined by the need for covert observations and by the resources available, and the choice of observers in turn affected the structure of the observational schedules. The obvious choice for primary observers in view of the characteristics of the setting was student classmates of the subjects, and the secondary observers were graduate nurses in the area. Resource problems indicated that at least one instructor would have to participate but it was proposed to keep this to a minimum in order to preserve neutrality. The student observers had completed one year of their educational programme and had some training in observation and recording having completed two university credit courses in Behaviour Modification which included an applied research project (see Psychology, 17:244 and 17:245, University of Manitoba General Calendar, 1983). The students were also continually exposed to data gathering principles as a major curriculum thread in the Nursing Process, which is a problem solving approach in almost universal use in nursing in North America (see for example the publications: The Nursing Process: Assessing Planning, Implementing, Evaluating, (Yura and Walsh, 1973), and The Nursing Process: A Scientific Approach to Nursing, Marriner, 1975).

During a pre-experimental trial, several recording details were determined. These included; the observational schedules, the reliability and suitability of the observers and the practicality of the procedures, the need for training, sources of concern and possible tension among observers, consistency in application of the independent

variables, and refinement of criteria relating to the dependent variables.

The target sampling ratio on the first two dependent variables of communication-stimulation, and motor activity-posturization, was once each half hour at times when the subjects (and observers) had a scheduled opportunity to be engaged in the behaviours under study. This was consistent with the findings of Powell, Martindale, Kulp, Martindale, and Bauman (1977) who presented data that suggested that momentary time sampling of once in 1800 seconds was generally as descriptive of the behaviour as were intensive schedules in cases where behaviours were of long duration. Generally, the subjects had between three and a half hours and four hours in which they were engaged in the activities of concern. A schedule of six samples on the first and second variables was agreed upon with two being simultaneous but separate. A more demanding schedule produced missed observations and dissonance in the observers and was related to conflict between the demands of the experiment and their own assigned clients. The observers rapidly established a satisfactory level of observer reliability.

The student primary observers had difficulty in establishing agreement on the four samples of the third dependent variable of feeding. This was not eradicated despite constant re-evaluation. Ultimately, two graduate nurses and one instructor agreed to make the observations on feeding and established a satisfactory measure of agreement. This level of agreement between nurse and instructor was of particular interest as differences in ideology relating to idealism versus practicality were often evident.

The schedule of behavioural observations per day that was adopted was similar to those used in a number of similar and dissimilar naturalistic settings (see Dailey, 1974; Quiltich, 1975; Iwata, Bailey, Brown, 1976; Montegar, Reid, Matsen, and Ewell, 1977; Zahar, and Fussfield, 1981; Burg, Reid and Latimore, 1979; Kunz, Lutzker, Cuvo, Eddleman, Lutzker, Megson, Gulley, 1982; and Brown, Willis, and Reid, 1981). The validity of the schedule rests on the consistency of the findings across subjects and behaviours in relationship to applications of the independent variables. Consistency was present over time both in experiments and in subsequent replications. However, the object of the observations was not to examine complex responses, often of long duration, in all their minutae, but whether when sampled they were occurring x number of times before treatment and y number of times following treatment.

Observational Reliability

Should the use of students as observers be questioned despite their training, it should be noted that behavioural psychology has used a variety of observers and contingency managers and includes delinquent boys managing delinquent boys (Phillips, 1968); undergraduate college students (Schwartz, 1977); teachers (Hay, 1977); non-psychology students in prisons (Bassett and Blanchard, 1977); parents (Isaacs, Emby, and Baer, 1982); high school students (Gladstone and Shermann, 1975); institutional staff (Faw, Reid, Shepis, Jeffrey, and Welby, 1981) and psychiatric nurses (Ayllon and Houghton 1964; Martin and Treffrey 1970; Martin 1972; and Martin, McDonald, and Murrell, 1973). Even "the self" is considered to be an effective observer by many including Goldiamond

(1967), Bandura (1976) and O'Leary and Dubay (1979). However, the central question is not who makes the observations but the reliability of the observations.

Baer (1977) suggests that the central question of reliability is simply how often do two observers, watching one subject, and equipped with the same behavioural definitions, see the dependent variable occurring or not occurring at the same standard times? The answer is that they agree about it x percent of the relevant intervals and disagree about it y percent of the intervals. Thus reliability is a function of homogeneity across observers. Baer (1977) whilst respecting the scholarly approach of statisticians, holds that the simple calculation of the number of agreements divided by agreements plus disagreements expressed as a percentage has a direct and useful meaning. Semb (1982) agrees with Baer that an empirical base does not need statistical analysis in order to be strong, providing it is built on variables that produce large and reliable effects or is not built on effects that simply reach a predetermined probability level. The teaching methodology under study had no predetermined probability effects, and as previously noted, required readily observable behaviour changes if they were to be useful. Thus, inter-observer reliability was calculated according to the percentage formula.

Kazdin (1977) pointed out that although accuracy is often inferred from inter-observer reliability data it is by no means inherent. Accuracy refers not to the standards set by the observers own agreements but rather their relationship to externally set and a well defined standard based on consensus. Kazdin (1977) further states that familiarity with the standard (dependent variable) is essential and this

may require a training period. This was achieved in that standards were set by the ad hoc group previously described, and the standards are contained within the description of the independent variables and observational instructions and criteria. Certain nursing care behaviours were difficult to describe and not found in available texts or audiovisuals. Thus, they were photographed with the actual patients (with permission) and reproduced as thirty-five millimetre slides. Training requirements were assessed during the pre-experimental trial and are outlined under the Procedure section.

Observer drift from a standard over time was also a concern of Kazdin. This was controlled in the experimental procedure as each group of observers changed with each experimental replication as successive student class groups were replaced systematically. Consistency among observers was not considered to present problems as only two pairs were used at any given time. Observers were made aware that observer reliability was being systematically checked as Romanyk and others (1973) have shown that it increases observer reliability. However, they were not informed of the characteristics of the experiment as Boylein and Nelson (1981) hold that experimenter expectations can effect the observations. Concealment of the nature of the observations was attempted in part by giving a plausible reason for the observations, and also by requiring the observers to experience the same treatment as the subjects. The reason given for the observation was to give assistance in developing a "more positive" evaluation system which was congruent with certain student requests.

Covert observations and confidentiality of the observations was expected as student behavioural codes do not take kindly to the concept

of "sneaking". The same codes were expected to be a barrier to recruitment of observers, but a satisfactory course credit inducement appeared to offset any aversion. This was also strengthened by a promise not to reveal their part at any time to their classmates, and by avoiding the use of names in the observational records. Subjects were questioned as to naivety at the conclusion of the term, and observers as to confidentiality at both the term end and on conclusion of the experiment in which they participated.

Social Validation

Social validation of the treatment was not considered in the initial stages as the experiment was to evaluate strategies already in use. However, the increasing concern to validate treatments in terms of importance to the individual or society, aceptability of the procedures to the client or guardian relatives, and consumer or client satisfaction, suggested that retrospective attention be given to social validation. The importance of the interventions has already been substantiated in the introduction. The acceptability of the treatment in the absence of predetermine criteria was appraised from the written accounts of the role-reversal experiences required from each subject. Although this was essentially subjective in nature there is some support from Wolf (1978) who declares that this is where Behaviour Modification "may find its heart".

Cost Effectiveness

This is a question of social importance at a time of a strong demand for economy. This may be addressed in three ways. What is the

cost: in terms of the instructors time and in materials used to implement the strategies? in terms of the time spent in the treatment condition rather than alternate learning experiences? and could the same results be achieved more economically?

Apart from a supply of filing cards, and four rolls of film plus their development, no monetary cost for apparatus was incurred as the items were currently used in the classroom or clinical area. Observations were scheduled within the time context of the students, graduate nurses, and instructors' normal duties and were not expected to detract from their normal performances. However, the economics of the time costs is a judgement that must be made in relationship to the results.

Summary

A within subjects design with a multiple baseline across three dependent nursing care responses was selected to analyse the effectiveness of three teaching strategies in a clinical nursing situation. The analysis involved four experiments, one to examine the three strategies as a teaching "package", and three to analyse each component independently. Each experiment was scheduled for three replications, and these occurred with successive members of the same class and with successive classes at the same time point of their programme. Data was to be presented explicitly and graphically and interpreted by visual inspection of the graphs. Observations were made primarily by student nurses who were classmates of the subjects, and also by graduate nurses and an instructor on one variable. The observations were covert and made according to a modified momentary time

sampling method with a systematically counterbalanced schedule for coincidental observations to use to assess inter-observer reliability. Social validity and cost effectiveness were also identified as areas of concern.

AN EXPERIMENTAL ANALYSIS OF THE THREE INSTRUCTIONAL STRATEGIES

The experiments are presented sequentially as follows:

1. An analysis of a clinical teaching package which includes firm instructions, and two role reversal procedures.
2. An analysis of firm instructions as a clinical instructional strategy.
3. An analysis of a role reversal procedure requiring the subject to spend a day in a wheelchair on an institutional ward simulating a multiple handicap.
4. An analysis of a role reversal procedure requiring the subject to spend a day lying on a mat within a ward setting simulating a fully handicapped person.

EXPERIMENT 1

Subjects

The subjects (and primary observers) were twenty-four students enrolled in a two year diploma programme in psychiatric nursing leading to eligibility to attempt registration examinations set by the Registered Psychiatric Nurses Association of Manitoba. The characteristics of the pool of subjects (and observers) were as follows: the mean age on entrance to the programme was twenty-two years and five months, with a range from eighteen years and eight months to thirty years and three months. Seven were male and seventeen were female. Two had an educational status of university graduates, thirteen had some university credits gained prior to entrance, six had completed a non-matriculation high school programme, and five were mature students with a grade twelve equivalency as measured by the General Education Development Tests conducted by the Department of Education in Manitoba. At the time of the experiment all had completed a minimum of three full credit courses including Behaviour Modification as part of their nursing programme. They were in the fourth term of a six-term, two-year programme and currently gaining clinical practice and instruction relating to the care of multiply handicapped children. Subject selection was by virtue of being assigned to designated patients by a graduate nurse who was unaware of the experiment. Observers were selected negatively by virtue of being assigned to other than the designated patients.

Setting

The dependent variables were nursing care behaviours given to a particular group of young multiply handicapped individuals at an institution for the mentally handicapped, the Manitoba Developmental Centre, in Portage la Prairie. The patients who were the recipients of the nursing care responses which constituted the dependent variables were selected by the care team for their similarity of presenting nursing care problems. They comprised a pool for the duration of the experiment. Each appeared to be socially responsive but totally dependent. Their degree of mental retardation was established negatively through reason of untestability and inability to show sufficient levels of adaptive behaviour to meet positive criteria as given in the American Manual on Terminology and Classification in Mental Retardation (1982). Each had the physical appearance of pre-pubertal or adolescent females although chronologically they ranged from 15 years to 20 years. Their weight range was from 29.2 kilograms to 33.5 kilograms. All could communicate responsively to simple questions related to care wants or preference through eye contact, smiling, frowning, crying, or gestures within the limits of their handicap. Four were classified as incomplete quadriplegia and two as diplegia. All had some degree of spasticity with two having chorea-athetosis superimposed. In five cases the cause was prenatal encephalopathy and in one case postnatal meningitis. Some degree of deformity was present in all joints and in the spinal column. They were totally dependent for all aspects of care including feeding, bathing, diapering, dressing, passive exercises, posturing correctly, psychological stimulation, and contact comfort.

Their waking hours were spent mainly either in a day room (approximately 10 m x 17 m in size) or outside in fine weather. They were also taken in minor excursions, and visited physiotherapy daily. Part of the day was spent in a wheelchair, and part in various positions on two large mats raised off the floor on a wooden platform. A television, radio, record player, and mobiles were present, and the room was shared by approximately fourteen people. Three similar rooms, four dormitories, three single rooms, two bathrooms, two toilet rooms, a workshop for the more able, and the usual offices, storage and utility rooms comprise Parkhaven's indoor environment.

Apparatus

The apparatus used in all experiments included a Pentax 1000, 35 mm camera and a supply of Ektachrome ASA 200 slide film, which were used to produce slides of depicting specific patients and their desired positions, and a Kodak Ektagraphic A-F100 35 mm slide projector. A Trainex Corporation film strip and sound cassette, The Young Spastic Child (SCN 1002, Trainex Corporation, Garden Grove, California) was also used for demonstrating movement and positioning, and shown on a Dukane Micromatic Projector. Other stimulus materials included a poster "Feeding the Cerebral Palsied Child" and obtained from Bloorview Childrens Hospital, Toronto, (undated). The subjects were required to be in possession of texts used for criteria which were Handling the Young Cerebral Palsied Child in the Home (Finnie, 1978) and a Textbook of Pediatric Nursing (Marlow, 1977). Two of each texts were available for experimenter use. Also required was a supply of 7.6 cm x 12.7 cm filing cards for data recording.

The only specific requirement for the first independent variable of instructions was a supply of 21.5 cm x 21.5 cm sheets of paper upon which the instructions were mimeographed. The apparatus for the second independent variable included an Everest and Jennings adult wheelchair, Everest and Jennings Traveller model TSN 250-770 with standard backrest, footrests, and detachable tray with the letters of the alphabet and numbers stencilled to the upper side. Also included were a plastic right angled channelled arm splint, a similar leg splint, and a supply of crepe bandages. The specific apparatus for the third independent variable included a sponge rubber pad, 1.5 m x 3.0 m x 8.0 cm with a cotton cover. Four straight channelled splints were required, plus a supply of crepe bandages. One clip board was also used, to which was attached a 27.5 cm x 21.5 cm sheet mimeographed with 68 selected Bliss symbolics.

Independent Variables

These were three teaching strategies, one was instructions, and two were experiential in-ward projects in which the subject was required to adopt the role of an in-patient. They were part of an existing programme and were therefore unmodified and presented as normally given by the instructor;

1. Instructions, which were presented verbally to a group of four to six students, including the subect or subjects. The instructor used a much firmer tone than normally used in briefing, and eye contact was made with each of the students who were seated around a small conference table. The instructions were as follows:

> During this experience you are at all times expected to follow principles and rules of good nursing care. This is particularly and emphatically the case regarding feeding and maintaining good posture and positioning. You are to ignore any advice from any member of the staff that suggests that your patient cannot be fed in a way other than flat, almost recumbent, or with the head tilted markedly back, unless specific instructions are given by a graduate nurse to the contrary. (in such cases you must be prepared to explain the rationale) You must be careful not to constantly scrape dribbling food off the patients mouth or chin despite the temptation. You are also to ignore comments that you are too slow. Unless you have left your patient for a specific reason, on no account (other than specific instructions to the contrary) must he or she be left lying flat on the back between the hours of 9:30 a.m. and 11:00 a.m., and between 12:00 noon and 3:00 p.m. The patient should be in a wheelchair, or on the tummy, or over a wedge or a roll, and must be stimulated in some way. Remember, that any time spent away from your patient without reason is stealing his time and reducing his development opportunities. You are reminded that these children are not only understimulated by others but also lack the ability to operate on their environment in order to obtain stimulation. As you may have an additional patient assigned, you should make arrangements with a colleague to provide the necessary care for one if you have to be absent to meet the needs of the other. Your are requested to be pleasant and polite to all members of the aide staff whom you are displacing for a short term, and who naturally may feel resentful. The philosophy to guide you in this experience must be one of positivism, and providing you are trying something rather than doing nothing, and using commonsense combined with your knowledge gained to this point in time, and are actively seeking to improve it, we should have a happy and productive experience.

2. Wheelchair; this was a simulated experience in which the subject spent a day in a role of a patient handicapped with a hemiplegia and with visual impairment. The directions were given verbally and in writing as follows:

> Objective: gains empathy and insight into the psychological and comfort problems experienced by individuals who are physically handicapped, cannot

communicate verbally, and who may or may not have visual impairment.

You are to spend the day in a wheelchair on Parkhaven with your dominant arm and leg splinted in a manner that precludes their use. You may not communicate verbally and will be blindfolded until after you have fed yourself lunch, after lunch you may communicate in symbols or an alphabet board. Your "buddy" with whom you are paired will be responsible for all aspects of your care including washing and getting you to the toilet if necessary. You may use the staff toilet but your handicapped condition must be maintained. Please complete an objective and subjective account of your experience as soon as possible afterwards. You may discontinue the experience if you feel ill.

3. Mat: this was a simulated experience in which the subject spent the day in the role of a patient with a spastic quadriplegia who could only make movements with extreme difficulty, and who could not communicate verbally:

Objective: gains empathy and insight into the psychological and personal comfort problems of individuals who have impaired function of all four limbs and cannot communicate verbally.

You are to spend the day on Parkhaven lying on a mat with your elbows and knees splinted in such a manner that you can move your limbs minimally. You will be fed flat by your "buddy" with whom you have been paired and who will be responsible for all aspects of your nursing care including toilet requirements. You may use the staff washroom but must be conveyed by your buddy or other fellow student to whom you have communicated the need. No verbal communication is allowed but you may use Bliss symbolics. You may discontinue the experience if you feel ill. Please complete an objective and subjective account of your experience as soon as possible.

Dependent Variables

These were three classes of responses made by student psychiatric nurses whilst giving nursing care to assigned patients who were

suffering from developmental and neuro-sensorimotor impairment accompanied by severe physical handicap. The response classes were:

(1) sensory stimulation and communicaton

(2) musculo-skeletal activity including passive exercises, body alignment, and positioning

(3) assisting with, or completely feeding the patient

The criterion for recording was the desirability of the activities as opposed to undesirability. Desirability was operationally defined as optimum nursing care in the three categories, or as clear attempts to move towards optimum goals. Undesirability included non-occurrence of the responses or no obvious attempts to move in the direction of the optimum.

The criteria for desirability or undesirability were those contained in Nancie Finnie, Handling the Young Cerebral Palsied Child in the Home (1977), Dorothy E. Marlow, A Textbook of Pediatric Nursing (1977), Trainex Film Strip, SCN, 1022, The Young Spastic Child (1980) and the guidelines on a poster, Feeding the Cerebral Palsied Child, Bloorview Childrens Hospital (undated), and the assigned patients existing individual nursing care plans. Do's and don'ts are also presented in a series of thirty-five millimetre slides prepared by the instructor with the assistance of a consultant physiotherapist and a fellow instructor.

The pre-experimental trial indicated that all shades and nuances of dependent responses could not be forecast accurately. Thus, retrospective consultations were required when the correctness or incorrectness of a response could not be determined. The consultant was usually the graduate nurse in charge of the ward or the department

physiotherapist who were not parties to the experiment in terms of participation. The criteria given below were a supplement to the audiovisual and printed materials.

Dependent variable 1: stimulation was regarded as occurring if the subject was interacting with the patient, or adjoining patients, in any form of communicative mode, or if any form of non-harmful contact was occurring. A positive score was recorded in cases when the student was absent but had made satisfactory arrangements with others to provide stimulation. Watching and listening by the patient was also positive unless the patient was disinterested and inattentive, or the stimulus materials were incongruent with the patient's developmental level. Sleeping or resting was positive providing it was within a rest period or the patient was tired or ill; in such cases the patient had to appear comfortable and possess a soft toy if it was appropriate, and if attendance was available on awakening. Overstimulation of cerebral palsied child such as throwing him in the air and catching, or any form of teasing which produced an undesirable sensorimotor response or psychological discomfort was negative. Any form of stimulation occurring in a relaxation period prior to exercise therapy was considered to be negative.

Dependent variable 2: motor activity - posturization was regarded as positive if the patient was positioned in a desirable manner for particular activities including; resting and sleeping, feeding, reaching and playing, watching and listening, exercising, toileting, bathing, and any other personal care activities. Handling and carrying methods were to be in accordance with the criterion reference sources previously specified.

Deviations from these methods were to be scored positively if they were specifically prescribed in the patients nursing care plan. For instance, it might be determined that the child's need for stimulation might take precedence over a physical need to maintain him in a particular position in which he could not experience the stimuli. Such decisions are not unusual in the rehabilitation process. A subject lifting or moving a patient incorrectly due to their relative physical ratio was regarded as acting correctly in the event that this was essential for the patient's health and safety. However, this was regarded as negative if help to perform the activities correctly was available but had not been requested. When posturing and positioning was less than that considered to be optimal due to lack of adequate supporting equipment, the response was regarded as positive if the subject had attempted to improvise, such as using rolled blankets in place of special bolsters.

Dependent variable 3: Feeding was scored positively if the principles contained in the criterion references were being followed. Where the patient had difficulties in swallowing in the upright position, the position was only correct if it was considered to be the optimum and specified in the nursing care plan. The student was regarded as acting correctly when following the direction of a professional responsible for the care of the child (this is always subject to ethical conduct decisions).

Performance Criteria

This was set at a mean of 90 percent on each dependent variable with no more than one behaviour on any one variable to occur on any one

day. The difference between the number of observations made each day on the first and second dependent variables and those made on the third translate into minimum acceptable performance rates of 86.33 percent on the first and second variables and 75 percent on the third.

Procedure

A single subjects, or within subjects design was used with three independent variables measured across three dependent responses, and across two subjects. Two further subjects were maintained in a no-treatment or baseline condition. The first independent variable was applied to the first subject (S1) on the fourth day, the second on the eighth day, and the third on the twelfth day. Observations were made until the end of the twentieth day on all subjects. The application of the treatment variables was delayed for a further two days in the case of the second parallel subject (S2) in accordance with the design. Capital letters were assigned to each of the phases consisting of the baseline of no treatment, and the periods following and contiguous to the three independent variables. these phases were lettered A, B, C, and D respectively. The initial experiment was replicated three times with systematic variations in each case. The experiment and replications were numbered, 1.1, 1.2, 1.3 and 1.4 respectively. Thus the initial experiment was 1.1, with an ABCD design within a subject and a multiple baseline across subjects.

The first replication (1.2) was identical with the exception that the order of presentation of the second and third independent variables were reversed. Thus, the second design was referred to as ABDC within

subjects. The first variable, instructions, was not changed in order throughout the series in accordance with its invariable natural use.

The baseline conditions were changed in the remaining two replications (1.3 and 1.4) in that the first independent variable of instructions was applied on the first day in order to reproduce the naturalistic or normative use of the variable. Thus, the first condition was instructions rather than a no-treatment baseline. The second and third independent variables were applied as in the 1.1 and 1.2 procedures, but the BCD and BDC designs allowed for slightly longer phases.

In summary, the within subject design involved one initial experiment that was replicated three times, with systematic variations with were referred to as ABCD, ABDC, BCD, and BDC within subject designs. Each also had a multiple baseline across subjects involving the subject pairs: S1 and S2; S5 and S6; S9 and S10, plus S13 and S14 respectively. Each experiment (1.1, 1.2, 1.3, and 1.4) measured the effect of three independent variables on three dependent behaviours. Pairs of subjects were also maintained under baseline conditions at all times, with S3 and S4 plus S7 and S8 measured against an analytic baseline of no treatment. Subjects measured from first condition of instructions were S11 and S12, plus S15 and S16.

Consistency in applying the first independent variable was achieved by having the same instructor deliver the instructions throughout all the experiments. These were normally given at a briefing before the student went to the clinical setting. The role reversal assignments and schedules were given at the same time together with other course materials and assignments. Thus, when a no treatment baseline was used

they were omitted from the briefing and were delivered at the scheduled time required by the experiment at a meeting arranged with the student called "to discuss certain items not covered on the first morning". The plausibility of this arrangement was strengthened by delaying certain other course matters to the morning of the second meeting.

The students nursing care "buddy" was responsible for setting up the role reversal states with apparatus kept on the ward. The status was checked after breakfast time by the instructor, and randomly thereafter.

The observations were made by student nurses on the first and second dependent variables, and by graduate nurses and an instructor on the third variable. The schedules are presented in Table 1 which shows that six observations were made on each of the first two dependent variables. Within a given day, the two observers each made four observations on both variables, two being made simultaneously but separately, and two made independently at different scheduled time points. The concommittent observations were used to calculate inter-observer reliability, and were systematically counterbalanced to provide reliability data on all sampling time points equally. The sampling times were determined pragmatically during the pre-experimental trial, and fell in the intermittent but regular periods during which the subjects were expected to give nursing care without direct supervision or prompting. Table 1 also shows that sampling in the case of third variable was performed by a graduate nurse and an instructor, but with only one concommittent observation which was governed by the nature of the observers particular job commitments. Eventually, the instructor was replaced by a second graduate nurse. The observation times on this

TABLE 1

Observational Schedule

1.1 Dependent variables one and two

Daily Order	Days					
	1	2	3	4	5	6
First	A	AB	A	B	AB	B
Second	A	A	AB	B	B	AB
Third	AB	A	A	AB	B	AB
Fourth	AB	B	B	AB	A	A
Fifth	B	B	AB	A	A	AB
Sixth	B	AB	B	A	AB	A

1.2 Dependent variable three

First	C	CD	D	CD
Second	CD	C	CD	D
Third	CD	D	CD	D
Fourth	D	CD	C	CD

Legend: A and B; primary observers (students)

C and D; second observers (graduate nurses and instructors)

Simultaneous but separate observations were made when A and B and C and D coincide. The schedules reverted back to Day 1 following Day 6 in Table 1.1 and following Day 4 in Table 1.2.

variable was determined by the patients nutritional schedule. Inter-observer reliability was checked weekly from the data cards, and calculated finally at the end of the experiment. Reliability was calculated by dividing the total number of observations on which agreement was recorded, by the sum of all the agreements plus disagreements, the result being expressed as a percentage.

The particular adaptation of time sampling required the observer to pause from their own task at the scheduled time or as soon thereafter as possible, or if necessary to leave their own task when necessary and appropriate, and to determine at that point in time whether the dependent behaviour was satisfactory or not. Should the subject have been off task only in that he or she was merely pausing to adjust their dress or person, or, moving between patients, recording necessary observations, obtaining necessary materials, or hand washing, then the sample time was extended to the time that the subject was in a position to give care to the patient. In the event that the subject was absent by virtue of supervisory direction, then resampling occurred at the first opportunity. When single observations were missed, that day's data was discarded. The signals for simultaneous observations were determined between the observers themselves, as what appeared to be appropriate for one pair was not always appropriate for others.

The observations were recorded on 7.6 cm x 12.7 cm filing cards and were easily carried and concealed in the observers pockets. They were graphed with observational times along the axis, and days along the axis. Instructions for the graph and the observations as given to the observers are contained in Appendix B. The cards held one week's data, and were marked with a tick if the behaviour was occurring

satisfactorily or a zero if it was not. A question mark was lightly entered if the observer could not determine if it was satisfactory or not, and in such cases this was determined retrospectively through consultation with a graduate nurse, instructor, physiotherapist, or other relevant professionals. The cards were handed in weekly and were inspected for error in procedure as well as for reliability calculations. The observers were informed that reliability checks were being made but were not given the true reasons for the observations.

Training requirements were not extensive as the observers were familiar with empirical observational techniques, and knowledge of the dependent nursing care behaviours was a course requirement of all students. A meeting was held a week previous to each experiment or replication to discuss the observational procedures. Typed copies of the criteria for determining the categorizing of the dependent responses were given to each observer who was given three days to study the material (which is reproduced in Appendix B). The observers then returned for clarification and further discussion. The audiovisual materials were presented to observers, subjects, and the non-participants alike who were scheduled to gain experience together as a group in the setting. All students were in possession of the books used to determine criteria as a course requirement, and the knowledge and ability to perform the necessary nursing care behaviours correctly was within both the observers and subjects repertoire. Graduate nurse observers were orientated separately and the student observers were unaware of their participation. The pre-experimental trials indicated that a day's rehearsal was required, thus the students first full day following orientation to the setting was used for this purpose. The

second day of observations therefore became the first day of the experiment. In the event that the observers may have encountered difficulty with the procedure, it was possible to delay the first day of the experimental observations until this was remedied. However, this did not prove to be necessary.

Results

Mean inter-observer reliability scores were as follows: DV 1, (communication and stimulation) 90.63%, calculated on 446 simultaneous observations; DV 2 (motor activity and posturization) 92.07%, calculated on 454 simultaneous observations, and DV 3 (feeding) 89.21%, calculated on 204 simultaneous observations. The range of agreement on the first two dependent variables was between 50.00% and 100%, and on the third dependent variable the range was between zero and 100%. The zero agreements were occasioned on days when only one simultaneous observation was made which resulted in disagreement. Previously it was anticipated that reliability checks would be systematically carried out by the student observers on the first and second variables but fewer checks would occur with the third dependent variable due to interfering work commitments of the graduate nurse and instructor observers. This was possibly reflected in the wider range of inter-observer agreements as there were a number of occasions when only a single coincidental observation was made. On ten of these occasions the single check resulted in disagreement, thus giving an inter-observer reliability rate of zero on those days. There were twelve days on which there was disagreement on one out of two simultaneous observations, giving a rate of 50 percent, and the remaining 182 coincidental observations resulted in 100 percent agreement.

Means of the phases

Figure 1 presents the mean response rates on the three dependent variables across all the subjects for each of the experimental phases of the ABCD, ABDC, BCD, and BDC designs. The precise data is also

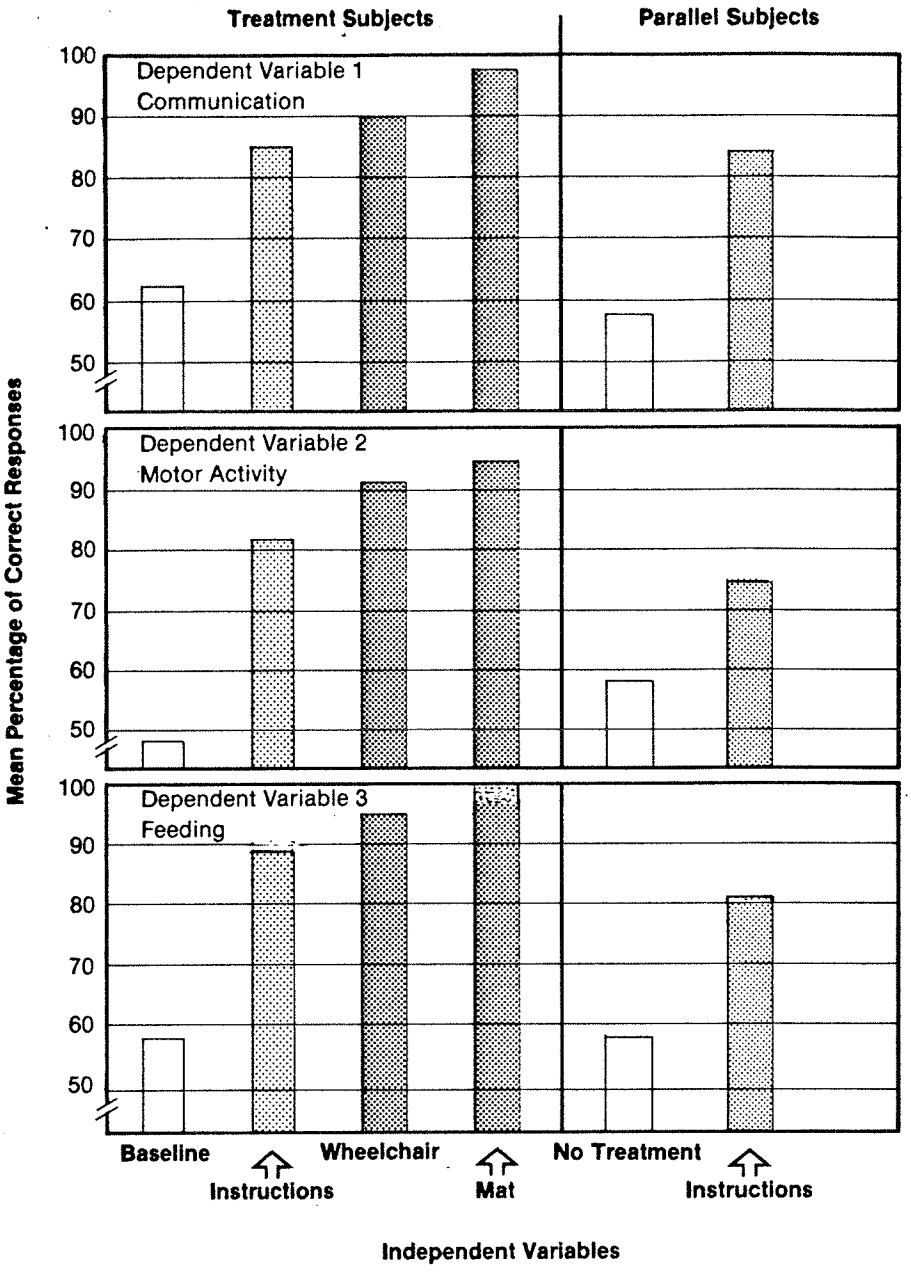

Figure 1. Mean percentage of correct responses across three dependent variables across all phases associated with each independent variable in the ABCD, ABDC, BCD, and BDC designs of Experiment 1, plus the A and B designs of the parallel subjects.

presented numerically in Table 2. Figure 1 clearly shows that the lowest mean response rates on all dependent variables occurred during the analytic baseline or "A" phase. The application of the independent variable of instructions was followed by distinct increases in the means of the three dependent variables across all the subjects, during the "B"

Figure 1 also shows that the means of the three dependent variable response rates across all the subjects in the "C" phase following the application of the wheelchair variable, were higher than the response rate means of the preceding "B" phase that followed firm instruction. Table 2 shows that the wheelchair phase means on the three dependent variables were 90.00%, 90.33%, and 94.44% respectively, which exceeded the previous instructions phase means by 5.79%, 7.00% and 6.08% respectively. Although the magnitude of the "C" phase gains appear small in comparison to the "B" phase gains it should be noted that the gains in the "B" phase consequently set limits on the magnitude of possible gains in the "C" phase.

Application of the mat independent variable is shown by Figure 1 to have been followed by the highest mean response rates on the three dependent variable across all the subjects. Table 2 shows that the response rates of 99.38%, 96.15%, and 100% on the three dependent variables respectively were at, or approaching the optimum, whereas it was noted that the response rates following the application of the wheelchair were at or above the criterion. Thus, the mat was associated with response rate means that were above those associated with instructions and the wheelchair independent variables on all three dependent behaviours.

TABLE 2

Mean percentage of correct response rates on three dependent variables of Experiment 1.

Treatment phases		DV one	DV two	DV three
Analytic baseline, A	A	62.25	47.92	59.36
Instructions (treatment) IV one	B	87.50	85.41	87.93
Instructions day one (baseline)	B	81.82	81.82	88.64
Instructions total means	B	84.21	83.33	88.36
Wheelchair, IV 2, in CD order	C	88.88	81.11	88.46
Wheelchair, IV 2, in DC order	C	93.18	98.48	100
Total Wheelchair, IV 2 means	C	90.00	90.33	94.44
Mat, IV 3, in DC order	D	96.67	98.89	100
Mat, IV 3, in CD order	D	99.38	94.44	100
Total mat, IV 3 means	D	98.33	96.15	100
Parallel subjects analytic base	A	58.45	58.68	58.68
Parallel normative base, IV 1	B	82.14	75.42	82.00

When the data is inspected only from the perspective of Figure 1 it appears to show a step by step progression associated with progressive application of the independent variables. However, when data in the wheelchair and mat phases are separated according to the order of their application, it is clear that there is an order effect. An examination of Figure 2 in conjunction with Table 2, shows that performance on the three dependent variables is consistently high irrespective of the order of the mat variable with the wheelchair variable. It is also clear, however, that performance following exposure to the wheelchair variable is higher on all three dependent measures if the wheelchair was preceded by exposure to the mat variable.

Performance by subjects on the three dependent variables during the analytic baseline and following application of instructions is validated by comparing the treatment subjects and the parallel subjects in Figure 1. Although small differences in means across the subjects are noted, in general, performance of the treatment and parallel subjects is comparable under analytic baseline conditions. Performance of treatment and parallel subjects are also comparable after exposure to instructions. The exception in the latter case is that performance in parallel subjects following instructions was, on average, slightly lower than the treatment subjects.

In summary, before treatment the subjects' mean response rates on the dependent variables were below criteria by a wide margin. The first independent variable of firm instructions was followed by distinctly higher mean response rates with the lowest margin of increase above the baseline being 25.25% in the case of the treatment subjects, however, the increased rates did not reach criteria. The second independent

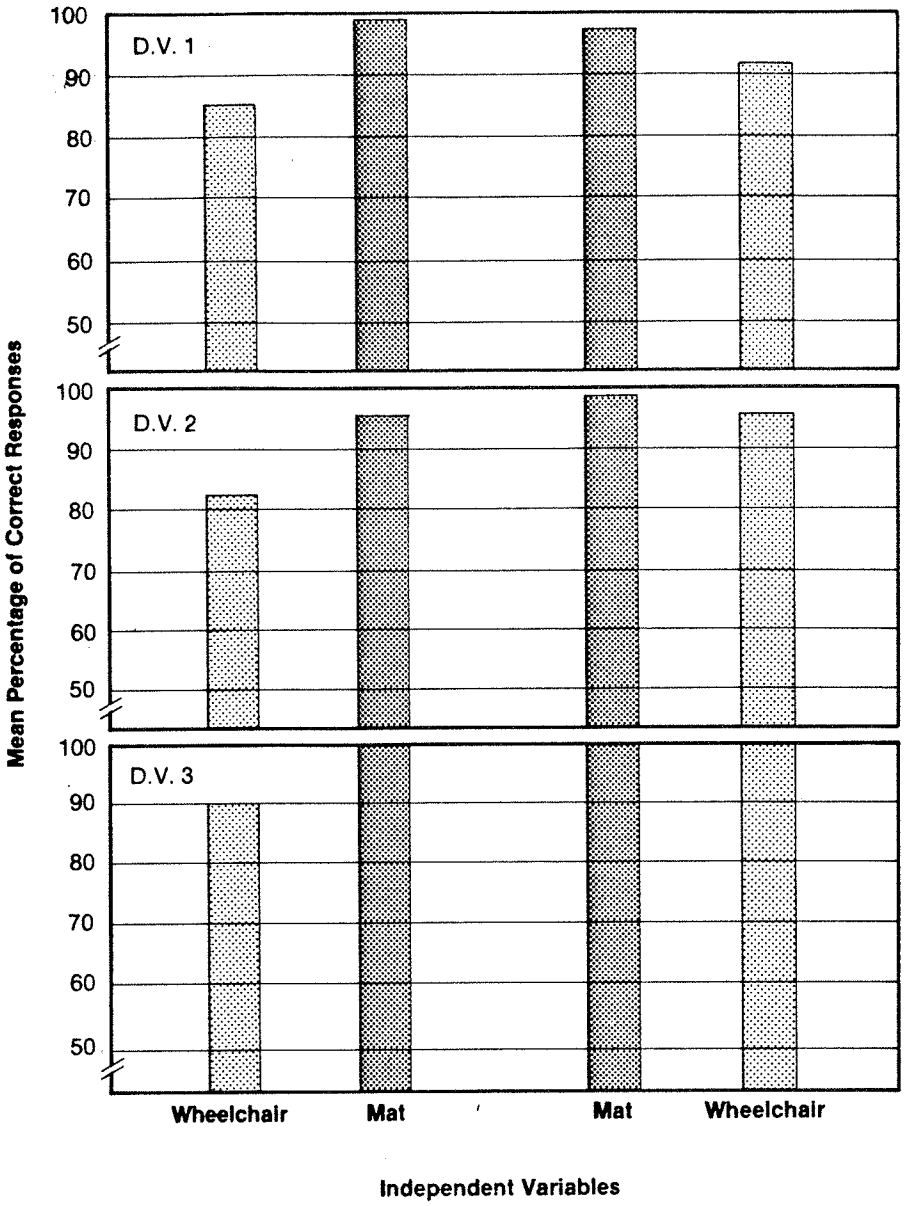

Figure 2. Mean percentage of correct responses across three dependent variables of the phases associated with the wheelchair and the mat independent variables separated according to the order of presentation (CD and DC).

variable, which was the role-reversal procedure that required the subject to spend a day in a wheelchair, was followed by only marginal gains over the phase that followed firm instructions, and was followed by marginal losses rather than gains when applied in reversed order following the mat phase. The third independent variable which was the role-reversal procedure which required the subject to spend a day immobilized on a mat was followed by mean response rate gains on all three dependent variable in both orders of application, and the mean response rates were above criteria in both orders of application.

Analysis of individual effects

The primary requirement of the Behaviour Modification model is that there should be a demonstration of a consistent association between the application of the independent variables and behaviour changes on the dependent variables. Such associations can be seen in the frequency graphs contained in Figure 3. Information also available from inspection of the graphs includes the size, immediacy, consistency, and durability or generality of effects over time. A detailed written and numerical interpretation of all the frequency graphs of all the subjects is not presented but they are contained in Appendix A and are thus available for inspection, comparison, and interpretation. However, the frequency graphs of Experiment 1.1 are presented in Figure 3 and are discussed as representative of the frequency data. The remaining frequency graphs are contained in Appendix A, and are available for any inspection, comparison, and interpretation.

Figure 3 presents the separate percentage of correct responses made each day individually by S1 and S2 on the three dependent variables

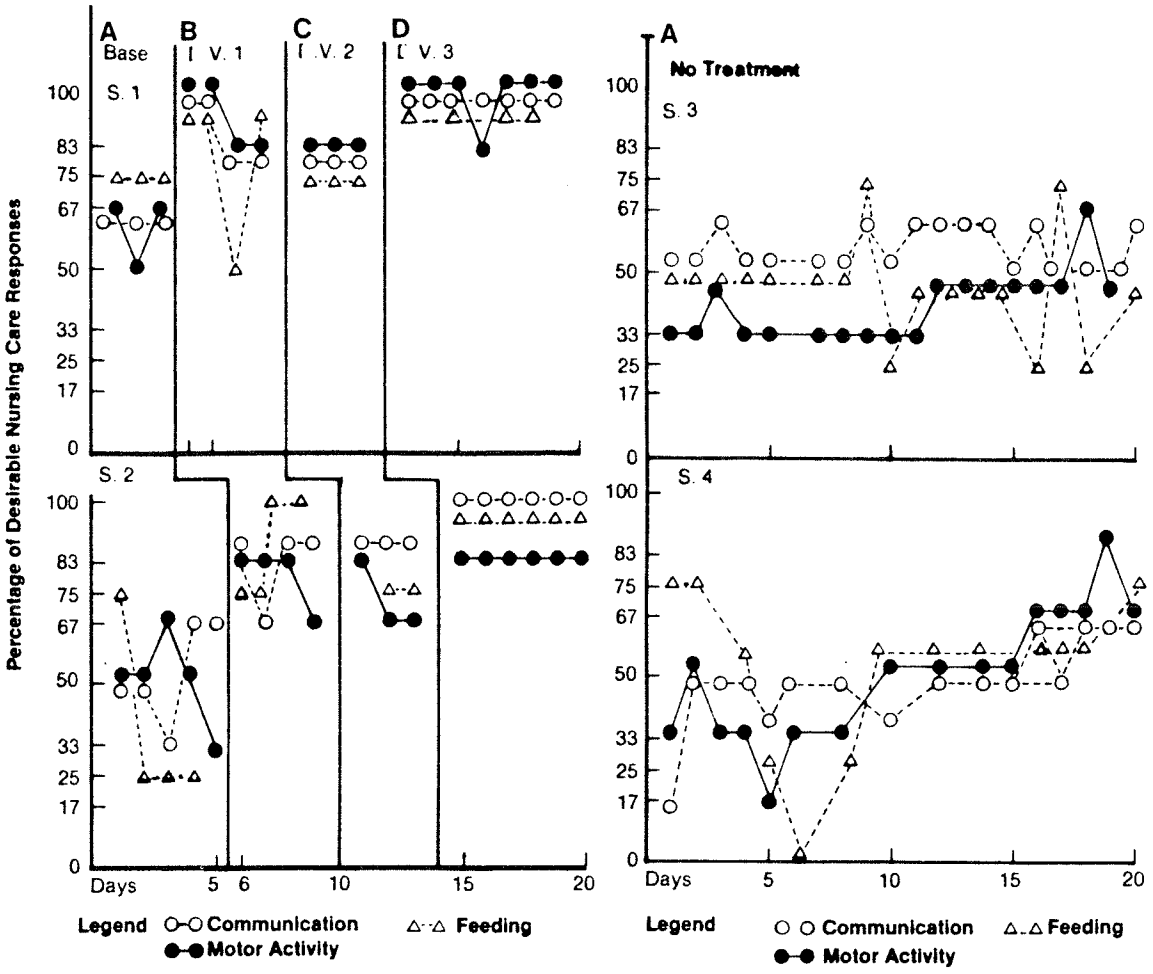

Figure 3. The individual subjects daily percentage of correct responses in the ABCD and A designs of Experiment 1.1 in which the independent variables were instructions (B), the wheelchair (C), and the mat (D). No-treatment subjects were maintained under baseline conditions (A).

respectively, plus those made on the same dependent variables by S3 and S4 who received no treatment, and were maintained in parallel on the analytic baseline.

Differences between the baseline performances of S1 and S2 are evident in that S1 showed more consistency in response rates across the three dependent variables than did S2. The first independent variable (IV 1) of instructions was applied before the commencement of the fourth day of observations in the case of S1, and before the sixth day of observation in the case of S2. Immediate gains occurred on each dependent variable following application of the instructions variable on separate days, thereby suggesting a treatment effect. The response rates rose to the optimum on all three dependent variables in the case of S1 but not in the case of S2. However, the size of the changes on the second and third dependent measures in the case of S2 were larger on both measures. Although the gains on the first dependent variable were considerably smaller than those on the second and third variables, the response rates on the first and second were identical to each other following exposure to the treatment variable. An immediate consequence of the application of instructions to S2 was a narrowing of the difference between response rates on the dependent variables which resulted in greater consistency across the three dependent behaviours. Durability through the phase was not fully evident on either the first or second dependent variable in the case of S1, and on the second variable in the case of S2, and each response rate showed a decline of 16.67% from the initial gains. However, the response rates at the end of the B phase on these two variables were higher than those on the last day of the baselines by a minimum of 16.67%. In contradistinction,

phase losses did not occur on the third dependent variable of correct feeding, and at the conclusion of the phase the response rates on this variable were at the optimum across both subjects. This represented a gain over the baselines on the third dependent measure of 25% in the case of S1, and a gain of 75% in the case of S2.

Figure 3 shows that the application of the wheelchair independent variable was not associated with any gains or losses on the first two dependent variables in the case of S1, and an immediate loss of 25% on the third dependent variable but, the response rates showed durability with consistency across dependent variables through the phase. No change in response rates occurred on the first dependent variable in the case of S2, and an immediacy gain of 16.67% on the second variable was subsequently lost. Thus the performance rates on these two variables at the end of the phase associated with the wheelchair variable were precisely the same as at the end of the preceding phase associated with firm instructions. However, a loss of 25.00% occurred on the third dependent variable. Thus, the wheelchair variable was associated with no changes in response rates at the conclusion of the wheelchair phase from those evident at the conclusion of the instructions phase on the first two dependent variables across both subjects. However, in the case of the third dependent variable, a loss of 25.00% occurred with both subjects.

Figure 3 shows that the application of the mat variable was followed by optimal response rates on all three dependent variables in the case of S1, and, apart from on fluctuation on the second dependent measure, the high response rates were maintained until the conclusion of the experiment. The response rates on the first and third dependent

variables also rose to the optimum in the case of S2 and the second increased to 83.33%. All the response rates gains in the case of S2 remained consistent and durable to the end of the experiment. Thus, the mat was associated with immediacy and constancy of effect across variables and subjects, and showed durability over the phase.

Improvement over time was also shown by the parallel no treatment subjects on the first and second dependent variables by both S3 and S4. However, response rates on the third dependent variable did not improve over the experimental period, and showed wide fluctuations in the case of each subject. The final two days response rates exhibited by S4 showed certain overlapping data points with the experimental subjects treatment phases associated with instructions and the wheelchair variables, but were below criteria on all three dependent variables.

A comparison with the frequency graphs of all the subjects of Experiment 1 tends to confirm the results. The one point of difference being between results that followed instructions when used as a treatment from an analytic baseline and when they were used to establish a normative baseline (it was noted previously that the response rate means were lower when instructions were applied on the first day than when used as a treatment). A second point of difference obvious in the frequency graphs in the Appendix is that response rates on the normative baseline did not tend to decrease over time unless they were quite high initially.

In summary, instructions applied as a treatment showed immediacy of effect across dependent variables, and was associated with greater consistency across dependent variables and subjects. However, exposure to instructions was not followed by durability in this experiment but by

a decline in response rates although they continued to be higher than the baseline. Generally, the frequency graphs of all the subjects of Experiment 1 which are contained in Appendix A show a tendency for response rates to decline following exposure to instructions, but only when applied as a treatment from an analytic baseline, or when initial response rates on a normative baseline were high.

Exposure to the role-reversal variable of the wheelchair was not usually followed by increases in response rates but in general was followed by no changes or by slight decreases across the three dependent measures. This tendency which is evident in Figure 3 is also evident in the remainder of the graphs in Appendix A relating to the experiment which also show that response rates were similar to the phases that preceded the application of the variable regardless of whether the variable was the instructions or the mat.

Figure 3 showed that the role-reversal variable of the mat was associated with optimal rates of responding on five dependent variables out of six, with the sixth being stable but slightly below criteria. The frequency graphs in Appendix A are similar, and show rates that were generally above criteria or at the optimum across all dependent variables and subjects regardless of the order of presentation. The means of the response rates that followed application of the mat were previously noted to be higher than those that followed either instructions or the wheelchair variables, whereas the individual frequency data shows in addition that the effects were immediate, consistent across dependent variables and subjects, and were durable over the length of the phases that followed its application.

EXPERIMENT 2

This was the first of three series of experiments designed with the objective of further analysing the effects of each treatment strategy when used separately. The design provided for longer phases which yielded more information regarding the persistence of any dependent behavioural changes induced by the specific independent variable. A change of setting occurred with the third, fourth, fifth, and sixth subjects after eleven days from the setting of Parkhaven which was due to course changes outside experimental control. However, it proved possible to continue observations as the subsequent experience was on an adjacent ward with similar but older patients. This was not regarded as undesirable as it provided some information as to generability even though observations were limited to two dependent variables, as adequate criteria on motor activity - posturization could not be developed within the lead time. Parallel no-treatment subjects were not used in this and subsequent experiments as this was not necessary in order to meet the objective. This practice is consistent with the concepts of within-subject designs.

Subjects

Two groups of twenty-four students served as a pool of subjects and observers for experiments two, three, and four. The groups were one and two class years behind the subjects of experiment one respectively, and were generally similar in characteristics. Two subjects from the first of these two groups and four from the second of the two groups served as subjects in Experiments 1.1, 1.2, and 1.3 respectively. Four subjects

from each group served as subjects in Experiment 3 and four from each group were to serve as subjects in Experiment 4. An equal number were observers. Selection of subjects and observers was identical to Experiment 1. Four students were to serve neither as subjects nor observers.

Setting

The primary setting in terms of the environment and patients was unchanged from Experiment 1. A second or generalization setting was provided by an adjacent ward which contained older patients with similar handicaps. The two patients who were assigned to the subjects for nursing care in the setting are described briefly. One was a twenty-eight year old male with spastic diplegia, he could partially feed himself, expressed himself verbally with great difficulty, was partially continent, and spent much of the day in a wheelchair which he could not manipulate. He was assessed as severely mentally handicapped and was given to noisy verbal outbursts. The second patient was a twenty year old male with athetoid quadriplegia, he could not feed himself, and spoke with extreme difficulty, he was incontinent, severely mentally handicapped, and was quiet and cooperative.

Apparatus

The apparatus was as the general requirements, and the specific requirements for independent variable one were as given in experiment one.

Independent Variable

This was firm instructions as defined under independent variable one in experiment one.

Dependent Variables

These were the same as in Experiment 1, although motor activity-posturization was not measured in the second setting.

Procedure

The within-subject design used one independent variable. The initial experiment (2.1) was an AB design with the independent variable applied on the first day to the first subject (S1) and to the second subject (S2) on the seventh day. Observations were continued for eighteen days. A parallel experiment with instructions applied on the first day was scheduled but not concluded owing to subject attrition.

The replications were performed at exactly the same time point with subjects from the successive class. Two subjects (S3 and S4) were treated identically to the initial experiment, and two subjects (S5 and S6) received the independent variable on the first day. Thus, experiments 2.1 and 2.2 had an analytic baseline, and experiment 2.3 was a naturalistic application.

Observations

The observational methodology was unchanged from Experiment 1 in the first setting, however, observations were not made on the second

dependent variable in the second setting due to difficulty in establishing satisfactory motor activity-posturization criteria.

Results

Inter-observer reliability was recorded as 90.54% on the first dependent variable of communication-stimulation; 95.77% the second dependent variable of motor activity-posturization, and 91.81% on the third dependent variable of correct feeding. The ranges of agreement were identical to those recorded in Experiment 1.

Means of the Phases

Figure 4 presents the total means across three dependent variables of all the subjects who received the application of firm instructions following an analytic baseline. Table 3 presents the means numerically and separates the pre-generalization data from the total phase means that followed the application of the treatment variable. The means in the case of the subjects who received the variable following an analytic baseline were below those reported for the treatment use of instructions in Experiment 1 by margins of 11.75%, 8.45%, and 12.15% on the three dependent variables respectively, but it can be noted that the increases in Experiment 2 were gained from baselines that were lower than those of Experiment 1 by margins of 8.09%, 0.42%, and 9.36% respectively. The total means of the phases following exposure to the variable, showed rates that were below the pre-set criterion rate of 90.00% by margins of 12.07%, 12.92%, and 15.00%, on the three dependent variables respectively.

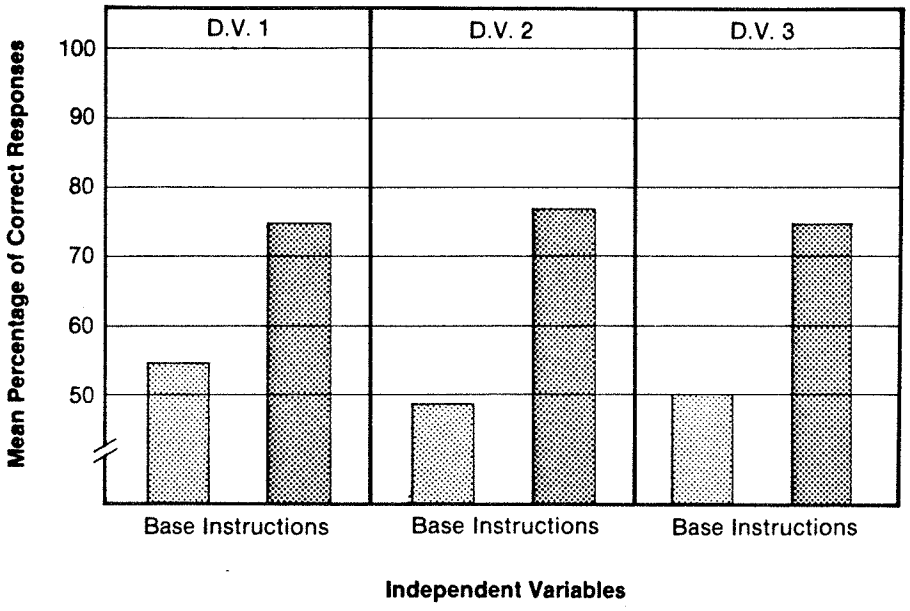

Figure 4. Mean percentage of correct responses across three dependent variables during the baseline and treatment phases associated with the application of instructions in Experiment 2.

TABLE 3

Mean percentage of correct response rates on three dependent variables for Experiment 2 with single applications of the first independent variable.

Treatment phases	DV one	DV two	DV three
Instructions from analytic baseline,			
Baseline	54.17	47.15	50.00
Exp. 2.1	76.64	78.17	68.75
Exp. 2.2, before generalization	78.33	76.67	87.50
Exp. 2.2, full experiment	72.20	76.67	82.50
Inclusive means	75.75	76.96	75.78
Instructions applied on day one,			
Exp. 2.3, before generalization	87.12	77.27	84.27
Exp. 2.3, full experiment	83.33	77.27	74.07

Table 3 shows that there were consistencies and inconsistencies across the means of the dependent variables in the initial experiment, 2.1, and in the replications; 2.2 and 2.3. For example, little difference occurred between the means of all the subjects on the second dependent variable, whereas on the first dependent variable the means of the normative baseline subjects distinctly exceeded those who received application of instructions from a normative baseline. Additionally, there were distinct differences between the means on the third dependent variable of the subjects in Experiment 2.1 and 2.2.

The means on the first and third dependent variables were clearly lower when the generalization data was included than when it was not. However, this cannot be held to indicate a failure to generalize over the settings as the full means of those subjects who changed their settings were not lower than those who remained in the original setting, but it does suggest a lack of durability or generality over time. This is in contrast to the findings of Experiment 1 insofar as the normative baseline subjects are concerned as they generally displayed durability over time in that experiment, although the subjects treated from the baseline in that experiment, plus certain high responding subjects did show some loss in response rates.

Analysis of Individual Effects

Figure 5 is presented as being representative of the individual frequency data, and shows the results for each day on the three dependent variables of each subject, expressed as a percentage of the total correct responses possible. Immediacy of effect and consistency across variables are clearly evident, however, a distinct deterioration

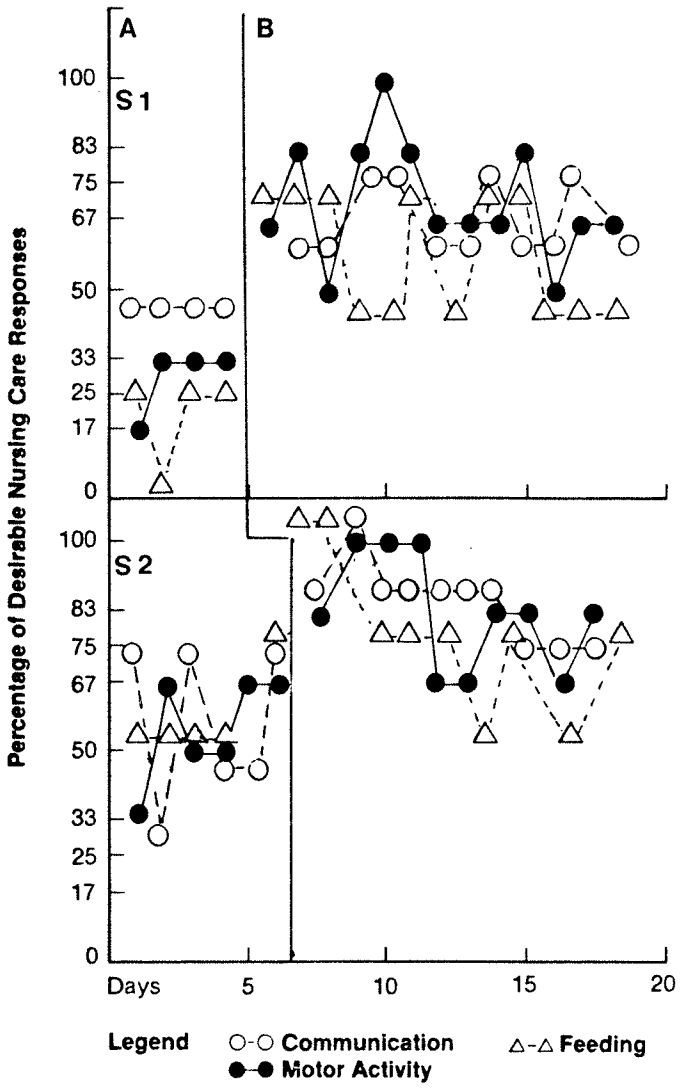

Figure 5. The individual subjects daily percentage of correct responses across three dependent variables in the AB design of Experiment 2.1 in which the independent variable was instructions.

of the performance of each subject on all three dependent variables can be noted over time. Referral to the frequency graphs of the other subjects which are contained in Appendix A show that a similar loss in performance occurred in the other subjects. The effect in these graphs appears to follow a change in setting, however, the drop in performance occurred at approximately the same time point as occurred in the case of S1 and S2 who did not have a change in setting. This suggests that the change of setting might have been coincidental rather than a failure to generalize to another location. Apropos to the frequency graphs in the Appendix, it may be noted that data collection was discontinued on one subject due to loss of naivety, and on another subject who required remedial intervention for a deteriorating clinical performance.

EXPERIMENT 3

The methodology of this experiment was similar to that of Experiment 2 in regard to design and observational procedures but the independent variable of concern was the wheelchair. This was applied from a no-treatment baseline in Experiments 3.1 and 3.2 but in Experiments 3.3 and 3.4 the baselines were established by the application of firm instructions on the first day.

Subjects and Settings

These were unchanged from experiment two.

Apparatus

This was the same as the general requirements, and the specific requirements for independent variable two, as described in experiment one.

Independent Variable

This was the wheelchair experience as defined as the second independent variable in experiment one.

Dependent Variables

These were as defined and used in experiment one.

Procedure

This was a within subjects design as previously described, and using the same capital letters to identify phases, experiments 3.1 and 3.2 were AC designs indicating an analytic no treatment baseline phase

followed by a phase induced by the application of the second independent variable. Experiments 3.3 and 3.4 were BC designs indicating a naturalistic baseline set up by the use of firm instructions followed by introduction of the second variable.

The observational methodology was unchanged from experiment one.

RESULTS

Mean inter-observer agreement was recorded as 94.44% on the first dependent variable of communication-stimulation; 95.65% on the second dependent variable of motor activity-stimulation, and 90.70% on the third dependent variable of correct feeding. The ranges of agreement were identical to those recorded in the previous experiments.

Means of the Phases

Figure 6 and Table 4 show that application of the wheelchair variable was followed by distinct increases in the means of all the dependent variables of all the subjects who were exposed to the variable following an analytic baseline. Application from a normative baseline established by the use of instructions on the first day was followed by a distinct increase on one dependent variable only, this being the second dependent variable with a margin of 10.25%. A marginal loss of 2.81% occurred on the first variable, and a marginal gain of 2.44% on the third.

The means following the application of the wheelchair variable from the normative baseline were clearly higher than when applied from the analytic baseline. In this regard it may be noted, that the mean response rates during the normative baseline phase following the use of

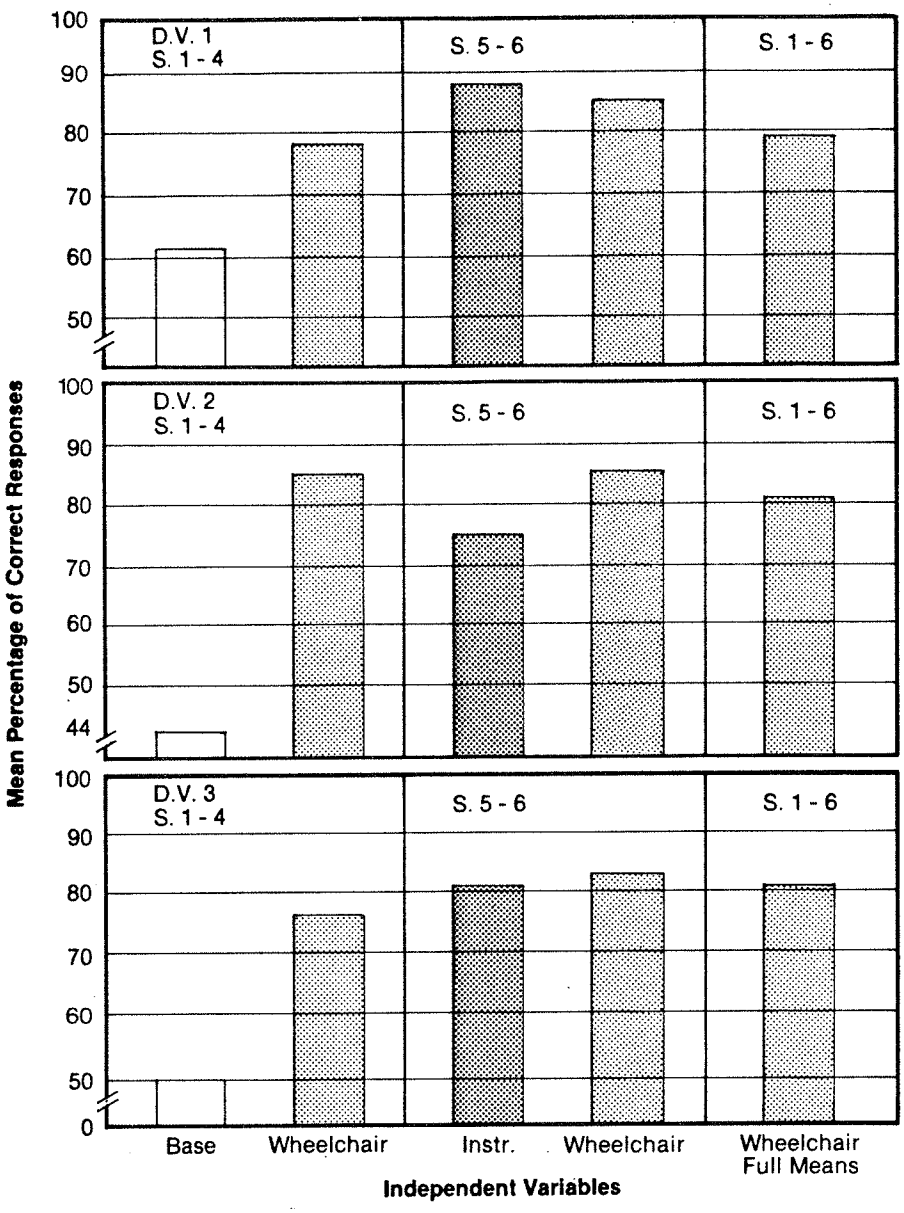

Figure 6. Mean percentage of correct responses across three dependent variables during the baseline and treatment phases of Experiment 3.

TABLE 4

Mean percentage of correct response rates on three dependent variables for Experiment 3 with applications of the second independent variable from a no treatment baseline (analytic baseline, AC design) and from a normative baseline established by firm instructions (BC design).

Phase	DV one	DV two	DV three
Analytic baseline	60.53	43.89	50.00
IV two	76.98	78.25	78.12
Normative baseline	87.18	75.64	81.25
IV two	84.37	85.89	83.69
Total IV two means	79.85	80.37	80.55

instructions, were higher on two measures than those that followed the use of the wheelchair variable when applied following an analytic baseline. However greater consistency across dependent variables was evident following exposure to the wheelchair variable than occurred in either of the baseline phases.

Analysis of Individual Effects

Figure 7 is presented as a representative sample of the individual frequency data, and shows the results for each day across the three dependent variables of each separate subject. Distinct and immediate effects are shown in the case of S1 in that the response rates rose by margins of 50.00%, 33.33%, and 75.00% on the the three dependent variables respectively, and the gains were sustained, with some minor fluctuations to the end of the experiment. However, in the case of S2, gains occurred before the application of the wheelchair on the sixth day which paralleled the first post treatment data of S1, which suggests that an extraneous variable may have been operating. In this regard the increased performance of S1 appears to be a possible variable. However, the frequency graphs of the other individual subjects which are contained in Appendix A do not show coincidental increases apart from a minor exception in Experiment 2. A distinct decrease in response rates on all dependent variables also occurred in the case of S2 after the fifteenth day, but this cannot be seen to be a general characteristic when the frequency graphs of all the subjects are inspected.

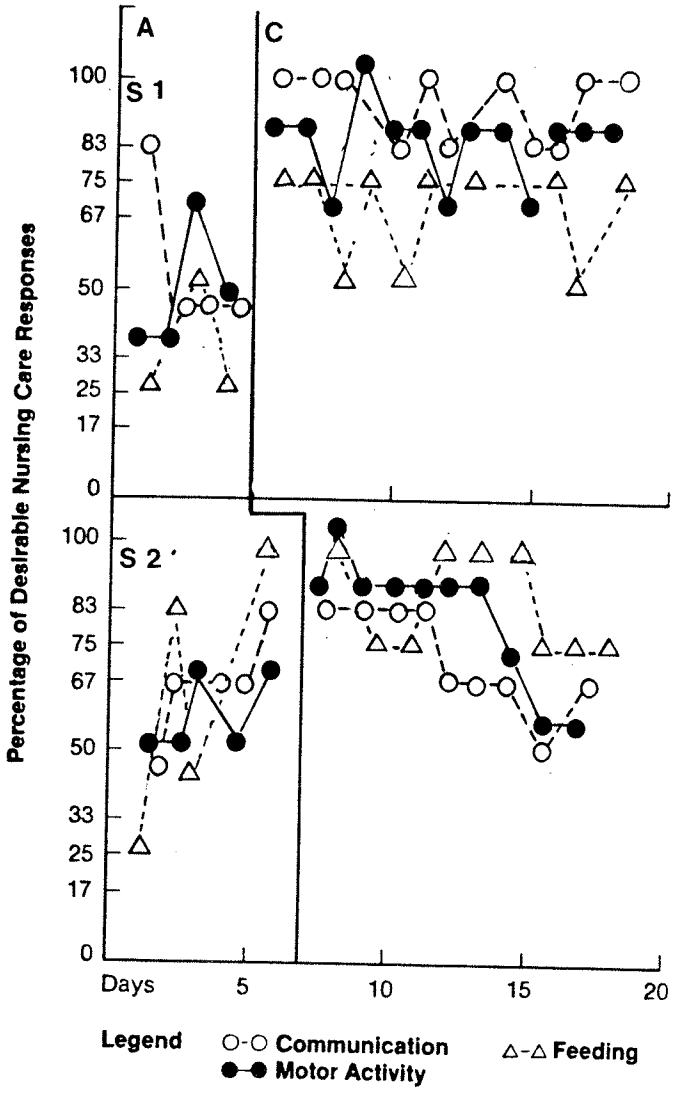

Figure 7. The individual subjects daily percentage of correct responses across three dependent variables in the AC design of Experiment 3.1 in which the independent variable was the wheelchair.

EXPERIMENT 4

The methodology, apart from the independent variable of concern was similar to Experiment 3. However, one change occurred in the case of the last subject pair in that they were scheduled to gain the last part of their experience at another institution, the St. Amant Centre, rather than Groveby. The patients were similar to those in Parkhaven, the primary setting, but were younger, and it appeared feasible to continue observations at the St. Amant Centre on two dependent variables. The independent variable was that of the mat experience requiring the subject to simulate a quadriplegia.

Subjects and Settings

These were as in experiment two except for one setting change, and two additional subjects were used from a fourth class as one experimental replication had to be delayed due to a break in confidentiality.

Apparatus

This was as for the general requirements, and the specific requirements of independent variable three, in experiment one.

Independent Variables

This was the mat experiment as defined as independent variable three in experiment one.

Dependent Variables

These were unchanged and were as defined and used in experiment one.

Procedure

The design was unchanged from experiment three but the change in independent variable required the designation of experiments 4.1 and 4.2 as AD designs, and the experiments 4.3 and 4.4 BD designs.

The methodology was unchanged except for a procedural change with the last two replications in that graduate nurses volunteered to take the data on the third variable and were able to make reliability checks on fifty percent of the observations.

Results

Mean inter-observer agreement was recorded as 94.41% on the first dependent variable of communication-stimulation; 95.14% on the second dependent variable of motor activity-posturization, and 91.00% on the third dependent variable of correct feeding. The ranges of agreement were identical to those recorded in the previous experiments.

Means of the Phases

Figure 8 and Table 5 shows that exposure to the mat role-reversal treatment was followed by response rate means that were higher than those that followed exposure to either instructions or the wheelchair across the three dependent variables of all the subjects. The means were below those associated with the mat variable in Experiment 1 being slightly below the criterion rate of 90.00% in the case of the first and

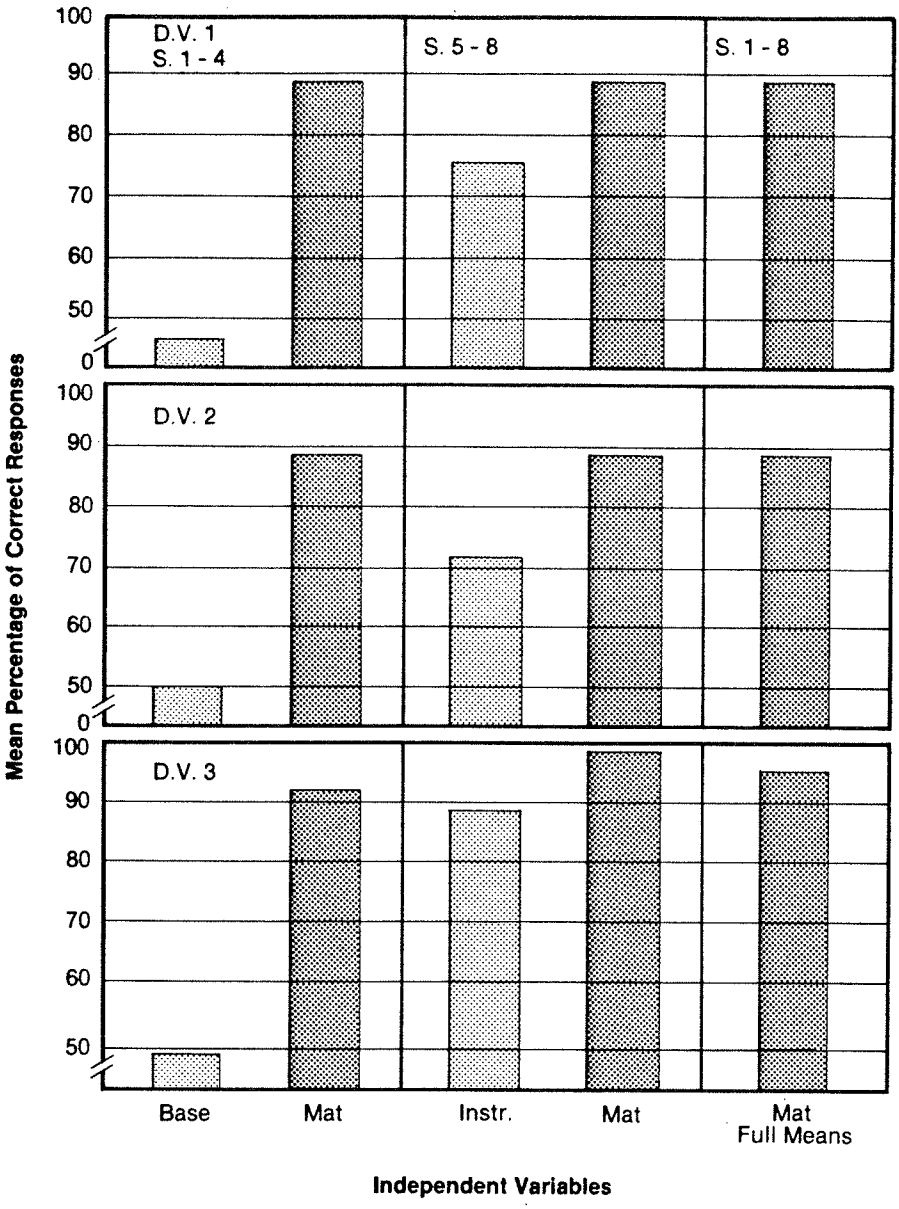

Figure 8. Mean percentage of correct responses across three dependent variables during the baseline and treatment phases of the AD and BD designs of Experiment 4.

TABLE 5

Mean percentage of correct response rates on three dependent variables for Experiment 4 with applications of the third independent variable from a no treatment baseline (analytic baseline, AD design) and from a normative baseline established by firm instructions (BD design).

Phase	DV one	DV two	DV three
Analytic baseline	47.36	50.00	48.68
IV three	89.19	89.02	93.48
Normative baseline	74.59	72.22	89.77
IV three	88.38	88.17	98.44
Total IV three means	88.81	88.66	95.51

second dependent measures, but above this level on the third. The response rate means were similar regardless of whether the treatment variable was applied following on analytic baseline or following a normative baseline, and this suggests that the variable exerts its apparent effect independently from any antecedent conditions.

Analysis of Individual Effects

Figure 9 shows the individual response rates exhibited each day by S1 and S2 and is expressed as a percentage of the total number of correct response rates possible each day. Distinct and immediate increases are evident across all three dependent variables rose immediately to the optimum in the case of S2 and thereafter remained above criteria except for one large and obvious fluctuation across all three dependent variables between thirteenth and sixteenth day. However, the rates recovered and had risen to the optimum by the last day of the experiment. Routine health records indicated that the subject was suffering from dysmennorrhoea during this period but, this must be regarded as one of the many extraneous variables not systematically controlled in the experiment.

Optimal responding was immediately achieved in the case of S1 on the third dependent variable, and response rates reached the optimum on the second and third dependent behaviours following one more day. Despite some fluctuations the response rates remained high, and optimal rates were recorded on the last day of the experiment, thus demonstrating durability over time. Inspection of the frequency graphs of the remainder of the subjects which are contained in Appendix A, show a similar pattern of responding with the exception of a markedly

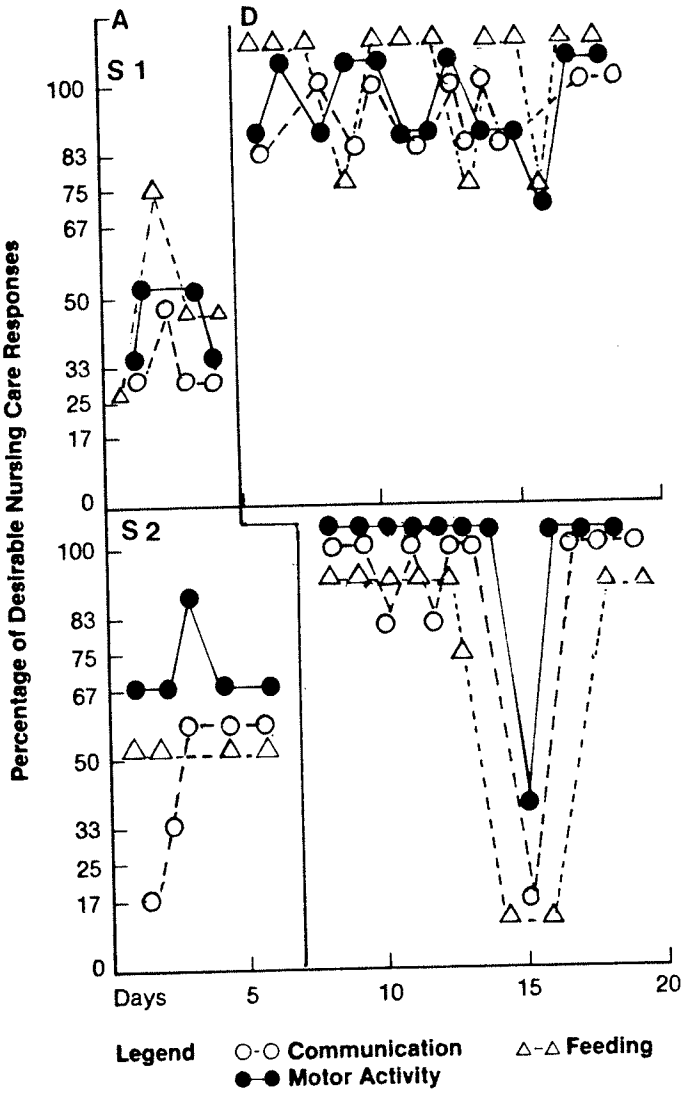

Figure 9. The individual subjects daily percentage of correct responses across three dependent variables in the AD design of Experiment 4.1 in which the independent variable was the mat.

aberrent performance in the case of one subject. (The latter performance may be of interest in that the subject had an excellent performance history and received a good evaluation for clinical performance in the experimental area.) The graphs in Appendix A show no tendency of the response rates to drop across settings. However, the data on two subjects was incomplete as conditions in the second setting changed, resulting in difficulties in scheduling observations accurately, and consequently the observations were discontinued.

DISCUSSION

The task of the data was to demonstrate whether readily observable changes in x, or y, or z (the dependent variables) occurred with consistency following the application of a, or b, or c (the independent variables) and in this regard, the data showed that immediate and distinct increases in response rates occurred consistently following exposure to the instructions and mat variables. Increases were seen to occur across all dependent variables in the majority of subjects whenever increases from the preceding phases were possible. Durability or generalization of effects over time was consistently demonstrated in association with the mat independent variable, but was not consistently demonstrated in the case of instructions. The data did not always demonstrate immediate increases in response rates following exposure to the wheelchair variable, but it is clear that the highest response rates occurred in Experiment 1 when the wheelchair was an included variable, along with instructions and the mat.

The patterns of behavioural changes that are evident in the frequency graphs clearly suggests that there was a functional relationship between the behavioural changes and the application of the independent variables, at least insofar as instructions and the mat are concerned. This was demonstrated in the frequency graphs of the parallel pairs in that the behavioural changes that occurred following the application of an independent variable to the first subject did not occur in the second subject until the independent variable was applied two days later. This pattern, with a previously noted exception, was seen in all successive replications, which, according to Campbell and

Stanley (1963, p.5) offers evidence that the changes in behaviour were related to the treatment and not to extraneous variables.

With regard to differences noted in consistency across dependent behaviours between the low baseline rates and the treatment phases, it should be noted that the sampling method used was held by Powell, Martindale, Kulp, Martindale, and Bauman (1977) to be an accurate representation of the behaviours under study when they were of long duration, but less accurate when the behaviours were of shorter duration. Therefore, it could be considered that the greater inconsistencies of the dependent behaviours shown during the analytic baseline phases might have been, at least in part, an artifact of the sampling procedures.

Differences can be noted between the observations made on the first and second dependent variables and those made on the third. The observations made on the first two variables were made by the subject's peers who appeared to produce more reliable observations than those that were made by the graduate nurse and instructor observers. This is reflected not only in the inter-observer reliability estimates but also in the frequency graphs which show distinctly that there were more days when data was not recorded on the third dependent variable than was the case with the first and second dependent measures. Thus, the data on the first and second dependent variables was more complete than that on the third. Additionally, a qualitative difference was possibly present as the observed responses in the case of the third variable were made in the presence of authority figures, whereas the observations in the case of the first and second dependent responses were made in the presence of the subjects peers and ancilliary staff only.

The identification of instructions as an important component of the package of teaching strategies was validated by the results despite certain inconsistencies in durability. These inconsistencies tended to appear between experimental replications in different time periods rather than across parallel subjects, and this tends to suggest that extraneous and possibly systematic variables were affecting the durability of instructions. This appears to be a reasonable assumption if Bandura (1969, p. 240) is correct in asserting that while instructions may elicit behaviours, they are not the agents of maintenance. There appears to be much experimental support for the position of Bandura (see for example, Ayllon and Azrin, 1964; Phillips, 1968; O'Leary, 1968; Rowe, 1981, and Zohar and Fussfield, 1981) Support crosses boundaries of thought in the social sciences, for instance, Bendall (1975) writing on attitudes in nursing and nursing education, states that while verbal directions are invaluable in establishing the cognitive part of attitudes, the behaviours can only be shaped in the practical environment.

Although Bandura (p.579) states that the purpose of instructions is to make individuals aware of the contingencies for gaining reinforcement it is apparent that many people remain unaware of the conditions. Baer and Wolf (1970) recognize this factor and hold that elicited levels of behaviour frequently evoke their own desirable consequences through their occurrence, and the behavioural levels are sustained through "entry into a community of reinforcement". Obviously a wide range of possible extraneous variables existed in the stimulus setting but the least speculative starting point appeared to be with the experimental data.

A general comparison of the frequency graphs concerning instructions, including those contained in Appendix A, not only demonstrate differences in durability between various experimental subjects over time, but also may draw attention to the possibility that differences existed in environmental stimulus conditions. Specifically, the normative baseline control subjects of Experiment 1 who showed durability over time following the application of instructions were in parallel with high responding subjects, whereas those of Experiment 2 whose response rates fell over time following the use of instructions had no high responding peers in parallel. This not only suggests that an extraneous variable was operating during one series and not the other, but also that the variable was possibly peer performance. A corollary may exist in that the analytic baseline control subjects of Experiment 1 who received no treatment yet improved to some degree over time were similarly in parallel with high responding subjects. However, there is no support for this possibility in the frequency graphs at the treatment subjects, at least insofar as immediacy of such an effect is concerned. This was demonstrated clearly in that increases in performance only occurred following application of the independent variables which occurred at a different time point in the case of each subject.

Nevertheless, the concept that peer performance was an operating variable is not only congruent with the psychological concept of situational inducement (see Martin and Pear, 1983, p.252) but also with sociological theories which assert that subjects will adapt to the performance norms of the situation (for examples in organizational settings, see Lawless, 1970, pp.260-279). However, sociological

theories might have difficulty in accounting for the high response rates exhibited by the subjects of Experiment 4 who were note in the presence of high responding peers.

Obviously a source of environmental variability could have been changes or inconsistencies in the procedures and practices of the instructional and ward supervisory staff. However before any attempt was made to assess the less tangible personal behaviours, it appeared pertinent to examine the empirical data which was available in the form of schedules, and health records, which in the case of the student subjects, included anecdotal records of phenomena that did not always occasion absences such as headaches, tiredness, and signs of stress. Also examined was a special events calendar. The data was compared day by day to the data recorded on each subjects abscissa and certain events were found to coincide both consistently and inconsistently with changes in response rates, although generally any changes were not large.

The most consistent factor that coincided with drops in performance was the absence of particular graduate nurses who were involved closely with patient care and although these nurses changed periodically the replacements appeared to have the same coincidental association with subject performance. No changes were associated with absence of either the instructor or the supervisor until late in the experiment, when a change in supervisors was followed by effects on subject performance similar to those associated with the graduate nurses.

One particular prolonged absence of a significant graduate nurse coincided with the decline in response rates of both subjects who were exposed to instructions in Experiment 2.1. Perhaps it should be noted that the drops in the response rates noted in Experiments 2.2 and 2.3

followed a change in setting. However, the coincidental absence of the graduate nurse is not necessarily inconsistent with the possibility that peer performance was the operating variable, as it is possible that the absence of the graduate nurse was accompanied by a general slackening of effort. However, it is equally possible that the particular graduate nurse's effect was not necessarily a controlling influence in a supervisory sense but might well have been the closest and most appropriate role model, or of course, a combination of both. Yet, in the absence of empirical evidence, this remains purely speculative. However, it should be noted that a primary objective of the experiment was to evaluate behaviours that were expected to occur in the absence of the instructors, and all observations were made in the instructors absence, with the exception of the dependent variable of feeding.

Student health records and anecdotal notations showed that minor illnesses and tiredness occasionally coincided with changes in response rates, although only two were associated with a marked effect, and were previously noted in the results of Experiments 1 and 4. Special events also occasionally interfered with response rates and were particularly noted at Halloween. However, this event appears to be marked by a large amount of general stimulatory activity by the subjects, and it may well be that the general activity interferes with individual assignments.

Thus, the examination of the records produced one variable that was systematically demonstrated in that performance changes that did not coincide with applications of the independent variable often coincided with the absence of particular staff members, although these changes were not marked except in apart from one particular instance. Additionally, the finding does not necessarily negate the possibility of

peer performance being the operating variable as the absence of the graduate might just as well have been a stimulus associated with a general lowering of effort which systematically went unconsequated.

A review of the instructors' procedures and methods conducted by two peers revealed only minor changes in procedures that could not be related to the more or less systematic changes that occurred between experiments following exposure to instructions. Similarly, no inconsistencies could be found in the performance of the ward supervisor that might account for the changes, although as previously noted a change in supervisors late in the experiment produced some changes in the stimulus setting. The changes were related to distinct differences in supervisory style with the new supervisor being more actively involved at the personal care level. This might well be reflected in the increased performance rates noted on feeding in the last of the frequency graphs contained in Appendix A.

One unexpected qualitative factor in the use of instructions is that they might have acted as a punisher in relationship to undesirable responses when applied following an analytic baseline. This possibility emerged from post-clinical discussions with students who inferred that they resented being admonished for behaving in a manner similar to others in the environment. A similar view was not expressed by subjects who received instructions on the first day prior to entering the setting.

Although the review of the data did not positively identify variables affecting performance rates following exposure to instructions, the evidence suggests that student performance in clinical

learning situations is strongly enhanced by firm instructions, or to use language from another paradigm, by a statement of role expectations.

Instructions are a simple and inexpensive tool yet they appear to have been frowned upon by Behaviourists and Humanists alike; for instance, Skinner (1963) asserted that they interfere with a functional analysis of behaviour, whereas Davidson and Neale (1982, p.59) interpret Rogers as taking the position that a person goes astray when he concerns himself with the evaluations and expectations of others. However, Bandura (1969, p.240) notes that too literal an application of Skinner has led to many persons relying on reinforcement to develop response patterns that can readily be produced by simple instructions, although Bandura goes on to emphasize that the power of verbal influence is largely determined by the anticipated or accompanying consequences. Therefore, if the position of Bandura is accepted, the task for the future insofar as performance in the clinical teaching situation is concerned, is to determine the agents which maintain or do not maintain the behaviours induced by instructions. However, should the ultimate goal of the nurse-educator be to satisfy his client and the employer, or consumer of his product, the emphasis at least on the surface, would need to be placed on identifying and strengthening the behaviours likely to evoke positive consequences in the employers "natural community of reinforcement". Unfortunately, the latter proposition would be based on the untested assumption that the behaviours which are reinforced in the employment milieu are those that are in the best interests of the patient or of the nurse.

However, placing the emphasis on immediate environmental controls may be over-simplistic as Bandura and Walters (1963, pp.165-167) point

out that behaviour is often maintained under aversive circumstances for extremely long periods in a society which places strong demands on the individual for achievement.

Distinct differences in size, consistency, and durability of effect were noted between the response rates of those subjects who were exposed to the wheelchair role-reversal procedure and those who were exposed to the mat. The response rates that followed the application of the mat variable tended to be stable over time, and were apparently unaffected by the extraneous variables that possibly affected the response rates which followed application of instructions. The wheelchair variable was noted to be less effective and less durable over time, and in some cases was followed by drops in response rates. Both the wheelchair and mat variables were applied under the same stimulus conditions which suggests that there might have been a qualitative difference between the two treatments, or alternatively, that that the mat experience was more relevant to the behaviours required in the setting than was the wheelchair procedure.

Evidence of a perceived differential impact of the role-reversal procedures on the subjects was contained in the evaluatory assignments required from each of the subjects (a sample of these is contained in Appendix D). Disregarding the emotive terms which might well have been a demand characteristic, the majority of the assignments suggest that the mat was a more profound, and for some a more disturbing experience, than was the wheelchair. The wheelchair experience was occasionally marked by some teasing of the subjects, and some foolery by all the students. This was controlled as much as possible, but the greater mobility associated with the procedure rendered control more difficult

than with the non-mobile subjects on the mat. A teacher external to the school of nursing retroactively assessed the subjects assignments on the basis of language that suggested high, medium, or low impact. According to Table 6(a) the wheelchair experience was assessed as follows: high, 4; medium, 8; and low, 2; the mat was assessed as follows: high, 14; medium, 2; and none were rated to be of low impact.

However, any presumption linking improved performance to emotional intensity may well be fallacious as it is equally possible that the relevant changes were cognitive. This speculation suggests that the differences that occurred between the response rates that followed exposure to the mat and wheelchair variables might be due to differences in their value as learning experiences, rather than differences in emotional arousal. However, in such a case, the question that follows is whether or not the dependent variables were equally suitable measures for both role-reversal procedures? This gives rise to a further question, which asks whether the role-reversal procedures as learning experiences were equally congruent with the nursing care requirements of the particular patients who were the targets of the subjects nursing care responses? In this regard a retrospective comparison of the day to day organization of the patients lives suggested that a bias might possibly have existed in favour of the mat, in that the variety of experiences encountered by the subjects while in the wheelchair were not always as representative of the patients routine as were the relatively better controlled experiences of the mat.

The possibility that the role-reversal procedures were only short term agents of behaviour changes which depended on other reinforcement for their maintenance in a manner similar to that purported for

TABLE 6

Social Validity Data

6(a) Teacher ratings of the impact of the role-reversal procedures assessed from the subjects written account of their experience

Independent variable	Impact		
	high	medium	low
Wheelchair	4	8	0
Mat	14	2	0

6(b) Self-reported acceptability of the procedure to the subject

Independent variable	Acceptable	Unacceptable
Wheelchair	14	0
Mat	14	2

6(c) Acceptability of the procedure to the ward staff

Independent variable	Acceptable	Unacceptable
Wheelchair	2	6
Mat	8	0

instructions should be considered. However, although similarities can be seen in the case of certain subjects that were exposed to the wheelchair procedure, there appears to be no evidence of this in relationship to the mat. It is possible to suggest that that the superior response rates that followed exposure to the mat were manifested in a qualitative as well as a quantitative manner, and as a consequence may have evoked proportionately more reinforcement from the environment. However, as previously mentioned, this may well be a simplistic view, as reinforcement evoked through performance is not necessarily provided directly by others. Indeed, Bandura and Walters (1963, p.162) assert that even in childhood self-generated stimuli may outweigh the influence of external stimuli in governing behaviour. Further, it was also noted previously, that behaviour is often sustained for long periods under aversive circumstances in a society that places heavy demands for achievement. Although persistent behaviours themselves might have multiple social goals and ultimate rewards, it is possible that successful performance in itself acquires reinforcing characteristics.

To summarize, the results show that distinct increases in response rates above baseline levels occurred across all dependent variables when the total package of strategies was used. The most effective applications appeared to be in the ABCD and BCD designs of Experiment 1 in which the order of presentation of the independent variables in which instruction (B) was presented following a no-treatment baseline (A) or on the first day, the wheelchair (C) was applied second, and the mat (D) was the last treatment. It should be noted that the relative contribution of the wheelchair procedure appeared to be small.

Nevertheless, the response rates were higher when it was an included variable than when it was not, and this can be seen in Experiment 4 in those subjects who received both instructions and the mat (BD), in that the response rates in that experiment were not as high as those in Experiment 1. However, it was noted that the response rates recorded in Experiments 2, 3, and 4 were generally lower than those that were recorded in Experiment 1. Thus, the high performance rates recorded in the first experiment were not fully replicated.

However, the mat role-reversal procedure produced high rates of correct responding in Experiment 5 with performance on the first two variables approaching criteria, and above criterion responding was present on the third. These rates of responding occurred consistently regardless of whether the mat was preceded by another variable or not, and the mat procedure clearly appears to be the most effective treatment variable.

Obviously, if economy of time is to be a consideration, the mat procedure is clearly the treatment of choice insofar as the two role-reversal procedures are concerned. This conclusion is supported by the social validation data contained in Table 6 (b and c) which presents the data in terms of the subjects self perception of the comparative learning value of the two procedures, and also in terms of acceptability to the staff in the setting. However, it should be noted that two subjects found the procedure to be unacceptable, which suggests that that it would be wise to provide a more descriptive briefing to the subjects together with a clear and unprejudiced right to refuse to undergo the procedure. It was noted that the apparent greater effectiveness of the mat in terms of inducing response rates might have

been related to a greater conguence with the nursing care problems of the patients in the setting. Thus, it is possible that there might be settings in which the wheelchair variable might be more relevant than the mat, as for example, in a rehabilitation setting for paraplegics. However, it is also possible that the relatively lower effects that followed application of the wheelchair might be attributable to a failure to exert sufficient control over application of the procedure. Nevertheless, the possibility remains that the role-reversal procedures might be limited in their general utility. This might not be the case for all role-reversal procedures which could probably be designed to have more generality, as for example, the experiences of virtual incarceration, previously mentioned, and which were well described by Rosenham (1973).

Although the mat variable was followed by high rates of responding without being preceded by instructions, the data suggests that it would be imprudent not to precede clinical experience by the use of instructions which can be delivered at almost no cost in terms of either instructor or student time. However, neither the data nor the retrospective review clearly identified the extraneous variables that either maintained or did not maintain the increased response rates that followed the use of instructions. The extraneous variables discussed, included among others, peer performance or situational inducement, the possibility of improved behaviour evoking its own consequences, and the presence or absence of certain staff members. Additionally, the literature suggests that the reinforcement and feedback systems of the teaching and work milieu should be examined for adequacy.

The single-subject design together with the use of the subjects' peers as observers appears to have been a useful method of studying behaviour in a practical setting when the dimension of concern was performance in the absence of supervision. The design possibilities were by no means exhausted by the experimental use of parallel subjects and subsequent replications as Watson and Workman (1981) point out that the design can also accommodate non-parallel but overlapping subjects in different settings. This would appear to be advantageous when evaluating strategies designed to have broader effects than those used in this study. In this regard Stokes and Baer (1977) insist that generalization should always be the active regard of researchers and practitioners.

However, before any subsequent use of the particular observational procedures it would be desirable to evaluate the sampling methods against a continuous measure of the behaviours emitted in the setting. Although it was previously noted that staff policies and the rights of patients to privacy precluded monitoring by videotape, it may well have been possible through more active representation to gain permission for the relatively short time required to validate the procedure. This, of course would be subject to rigorous safeguards in the increasingly sensitive area of the right to personal privacy. In retrospect, videotapes could also have been used to provide a more dynamic presentation of the expected nursing care behaviours. These could have served both as an initial teaching tool and as criteria for observations.

Finally, in regard to the dictum of Stokes and Baer (1977) regarding the need to select strategies with generalization in mind, it should be noted that this implies a freedom of choice over the selection

of experimental subject matter. However, this is infrequently extended to teachers in two-year post secondary institutions who may wish to conduct research within the context of their job. The constraints imposed upon the teachers frequently includes their position descriptions (an example is included in Appendix E), the nature of their teaching assignments which in some cases have narrow and specific dimensions, low or no financial supports, limited access to relevant literature and research consultation, and perhaps, as Gregor (1979) suggests, that "critical thinking" is not perceived as germain to the functions of the two-year colleges.

Nevertheless, the present study suggest that despite the constraints, extended evaluative experiments can be conducted within the context of the teachers assigned course responsibilities. Although the single-subjects design and the explicit observational procedures were adopted as the preferred methodology, the economics of the procedures were an important factor in maintaining the experiment over time. The critical economic factor was in terms of observational time, in that the observations used only a few minutes of student and staff time within the routine and context of their daily activities which were undiminished. Except for a supply of filing cards and four rolls of film, no costs were incurred for apparatus as the items were regularly used in either the classroom or clinical setting. Therefore, it may appear that personal research in similar circumstances and settings may be more dependent on a cooperative milieu than upon economic and bureaucratic parsimony in regard to research.

However, there are certain implications for educational administrators in all types of institutions that offer nursing programs

which become more clear when viewed in the light of current practice. The usual press of nursing educators is directed towards securing clinical learning experiences in settings where performance standards are high and activity levels are intense. These experiences are often short in length as there is a considerable and often competitive demand for experiences in these settings between schools and also between professional and paraprofessional disciplines. Hospitals extending the use of such facilities insist on a low ratio of isntructors to students, such as 1:4, for example, and also insist that an instructor be present with the students at all times. This is usually regarded as an ideal teaching situation as the student is continually exposed to good role models and high performance norms, and has the guidance and support of an instructor who is always present. However, it may well be that a tendency to rely on these settings exclusively might have a drawback in that students may not have an opportunity to develop independent personal performance norms. This may be more important in the case of two year diploma programmes than in university baccalaureate programmes which tend to foster independent practice, particularly in the fourth year.

The present study suggests that students can develop high personal performance norms within a relatively short time and in the partial absence of an instructor and in settings where the care norms are below the optimum. However, it is clear that these standards were not achieved without intervention strategies although untreated subjects did show improvement over time in Experiment 1. What is not known about the untreated subjects is whether their performance would eventually have reached satisfactory levels if given a longer experience but it is clear

that they did not reach such levels within the time dimensions allowed for the specific experience described in this study. Thus, while the results of this study support the arguments of those who argue that innovative teaching strategies can be effective in improving student performance it cannot refute the arguments of those who hold that contemporary experiences are too short.

Although one of the strategies, firm instructions, with its inherent connotations of "do as I say" might not appeal to academe as much as the role-reversal procedures with their more philosophical implication that "I do unto others only as I do unto myself", the data suggests that instructions might well be considered to be a matter of policy when planning learning experiences in clinical settings. The data and the literature suggested that certain other conditions might have to be present in order to sustain performance. These were not examined experimentally in the present study but were suggested to include reinforcement and either the controlling or modelling effect of a practitioner in close proximity to the students. There appears to be an implication from this that it would be prudent to ensure that these variables are either present or can be provided systematically before approving clinical experience in a relatively low performance setting. However, it might be even more prudent to base such decisions on further research into the effects of these variables in such settings.

The increases in performance that regularly followed the application of the mat variable suggests that role-reversal procedures can be effective in increasing performance. However, the relatively lower performances that followed application of the wheelchair variable together with difficulties in control and a low level of acceptance by

staff in the setting suggests that role-reversal procedures should be examined for relevance, control conditions, and acceptability to others in the environment. The rejection of the mat procedure as not being fully acceptable by two students is perhaps of greater concern to educational administrators who have an inherent responsibility to protect students from possible harm that might be occasioned by teaching practices. In this regard it might well be beneficial not only to require informed consent by the student, but also to require that role-reversal procedures such as those described in this study be evaluated in terms of ethics, preferably by a committee on which students as well as faculty are represented.

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APPENDIX A

This appendix contains the individual results of each subject graphed as a daily percentage of correct responses across three dependent variables in all experiments. The graphs, with one exception, are presented in groups of four in each of ten figures. This presentation facilitates comparison but leaves space for short captions only. Thus, throughout the series the analytic or no-treatment baseline, and the independent variables of instructions, the wheelchair, and the mat are indicated by the letters A, B, C, and D respectively (half the experiments commence with instructions applied on the first day to establish a normative baseline as distinct from the no-treatment baseline). The letter E signifies a change of setting, and discontinuance is indicated by X. The reason for discontinuance when X alone appears is loss of subject naivety, X followed by Y indicates remedial intervention, and X followed by Z indicates an organizational problem is continuing data collection.

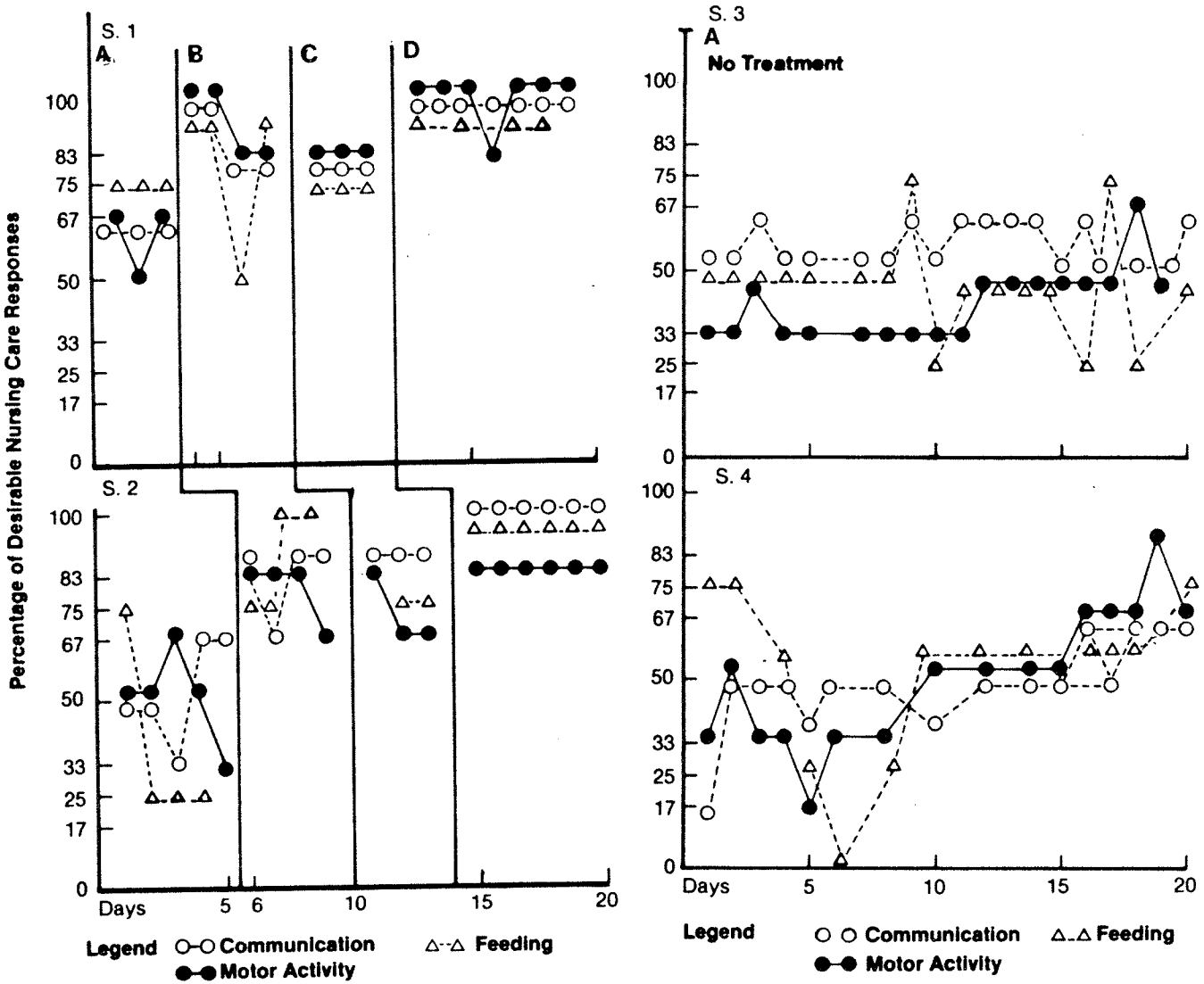

Figure A-1. The ABCD design of Experiment 1.1 in which the independent variables were instructions, the wheelchair, and the mat, applied from a no treatment baseline.

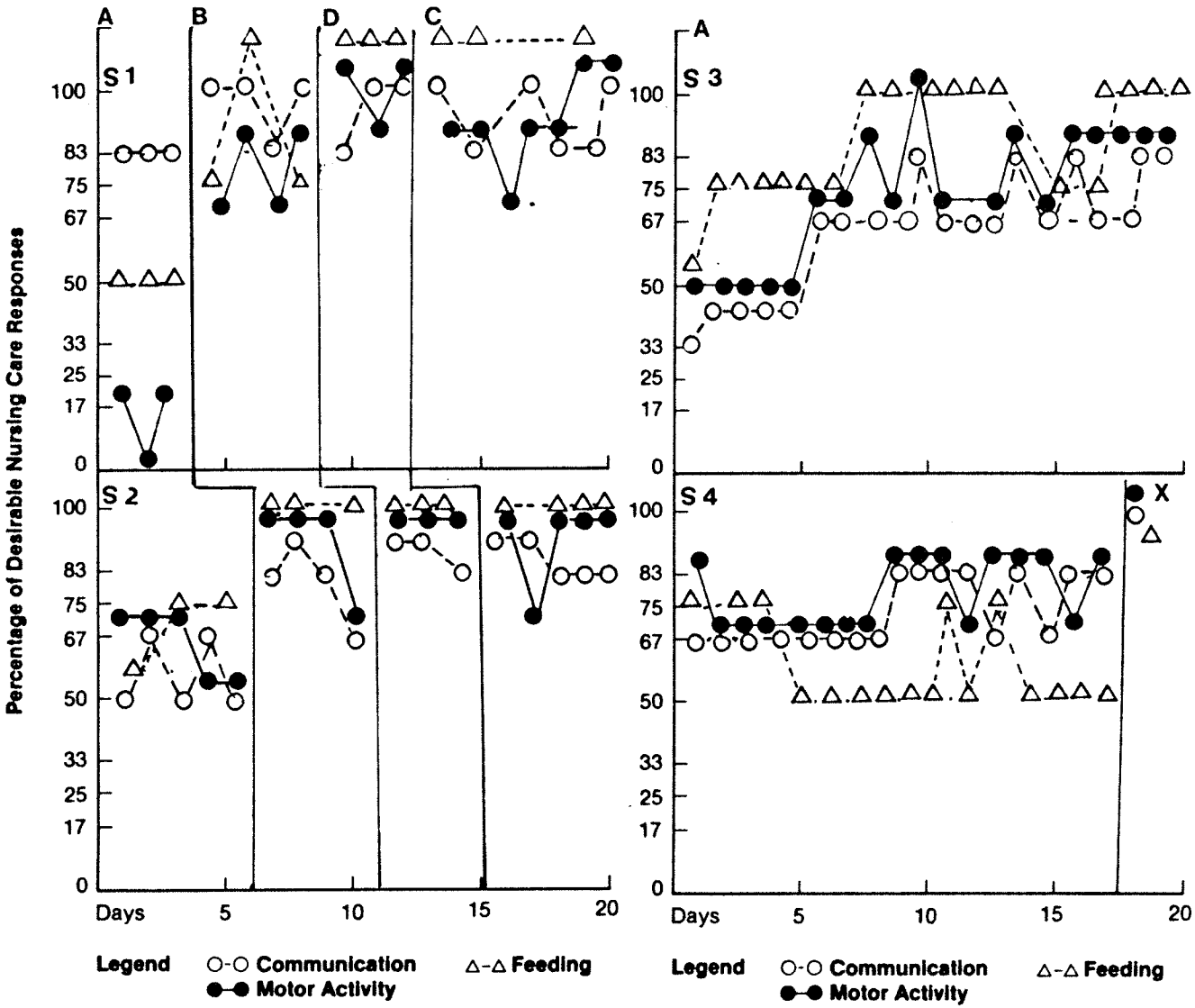

Figure A-2. The ABDC design of Expeiment 1.2 in which the independent variables were instructions, the mat, and the wheelchair applied from a no treatment

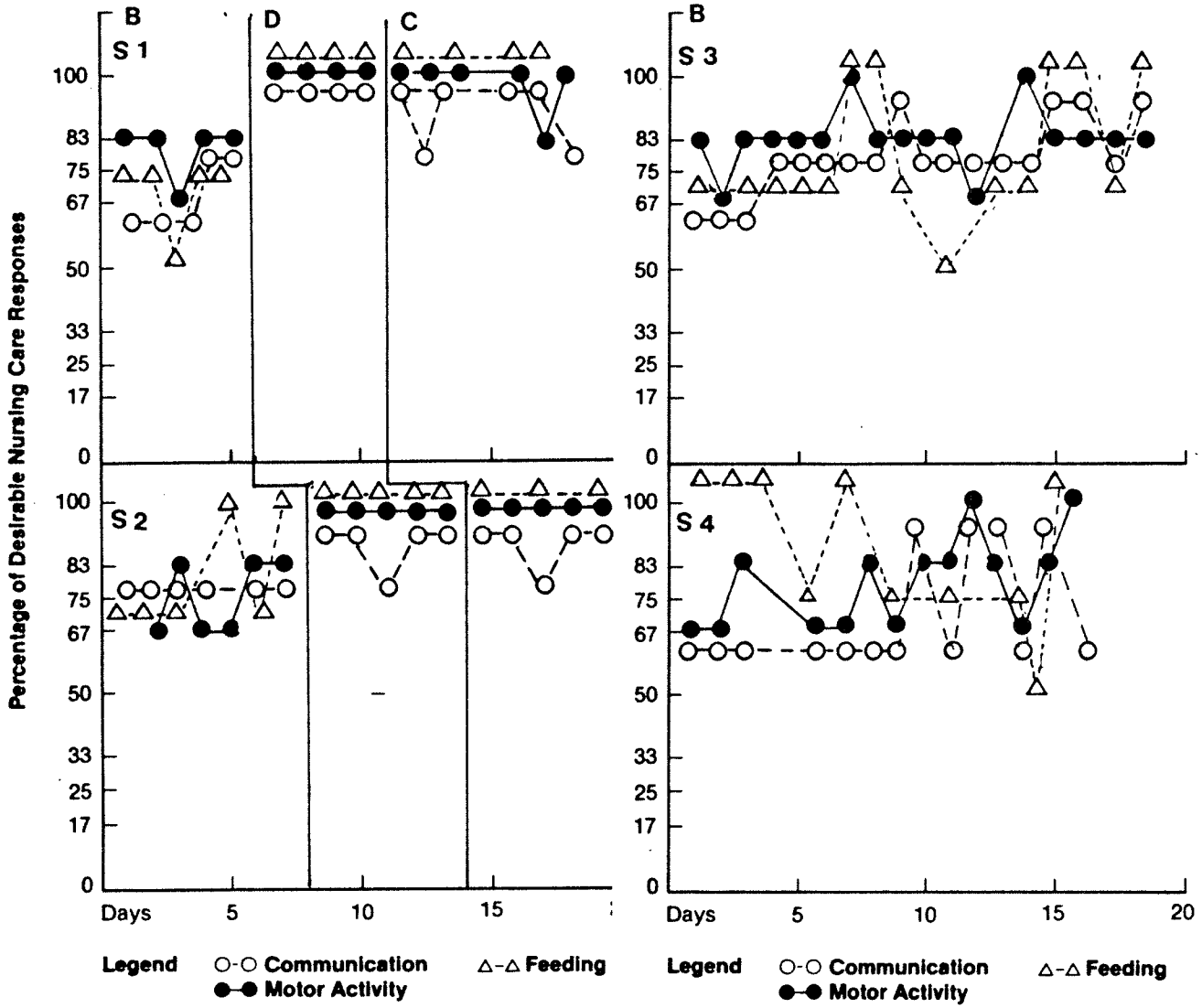

Figure A-3. The BCD design of Experiment 1.e in which the independent variables were instructions (applied on the first day) the wheelchair and the mat. S4 was interrupted by sickness.

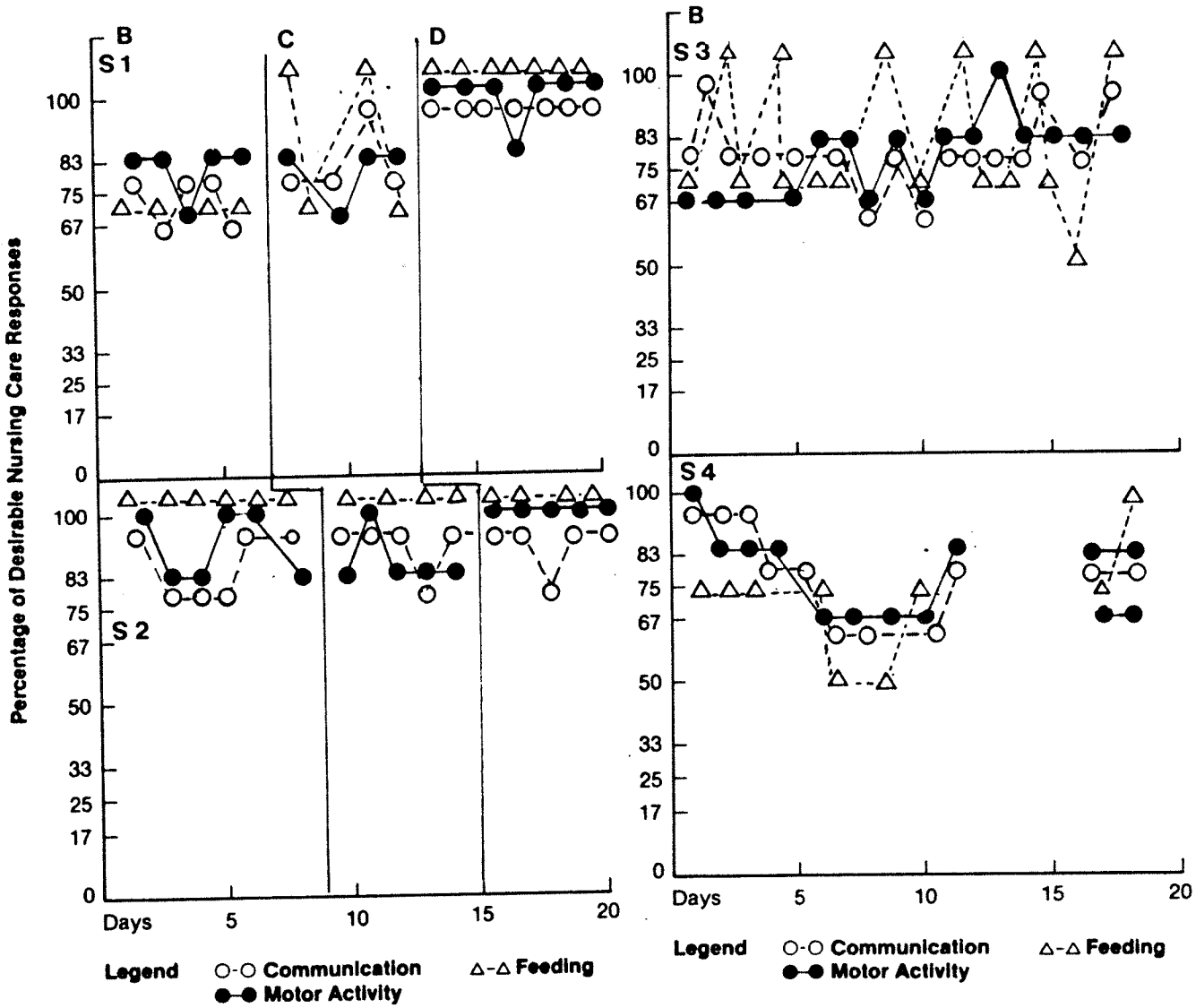

Figure A-4. The BDC design of Experiment 1.4 in which the independent variables were instructions (applied on the first day), the mat, and the wheelchair.

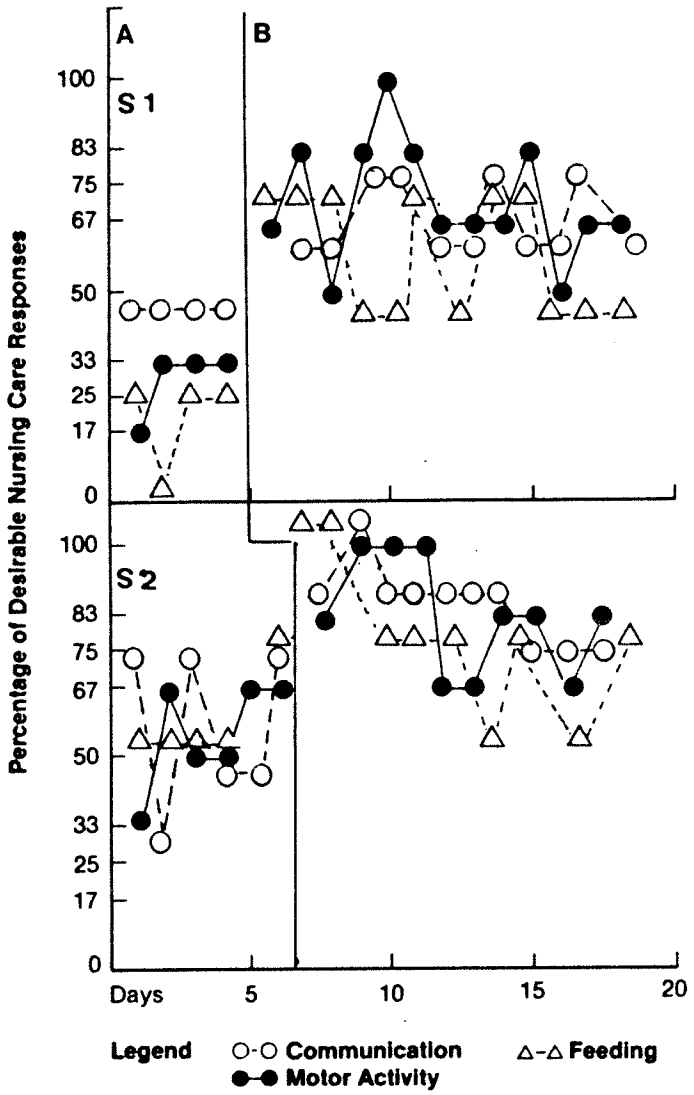

Figure A-5. The AB design of Experiment 2.1 in which the independent variable was instructions.

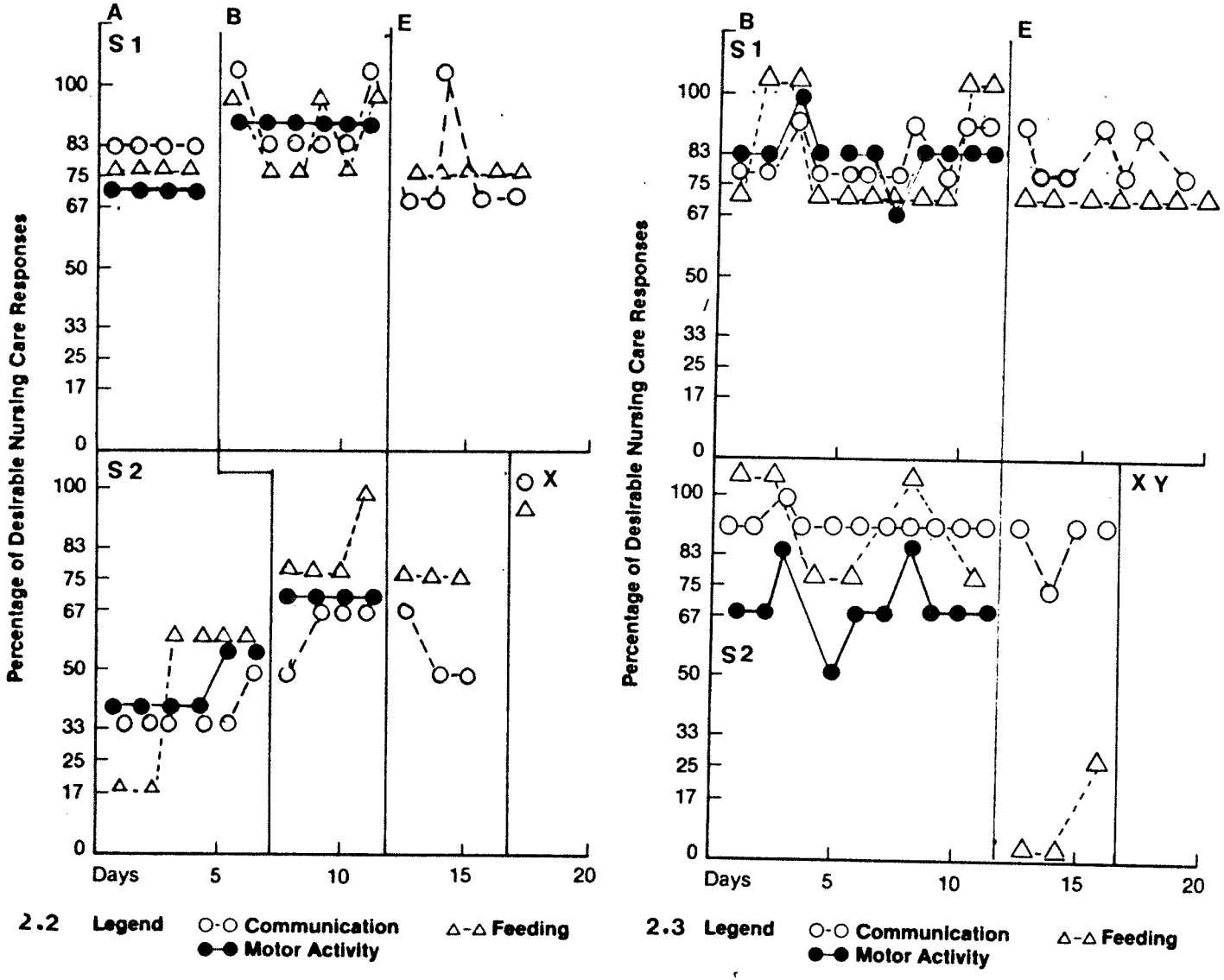

Figure A-6. The AB and B designs of Experiments 2.2 and 2.3 in which the independent variable was instructions. A change of setting occured at E, and subject

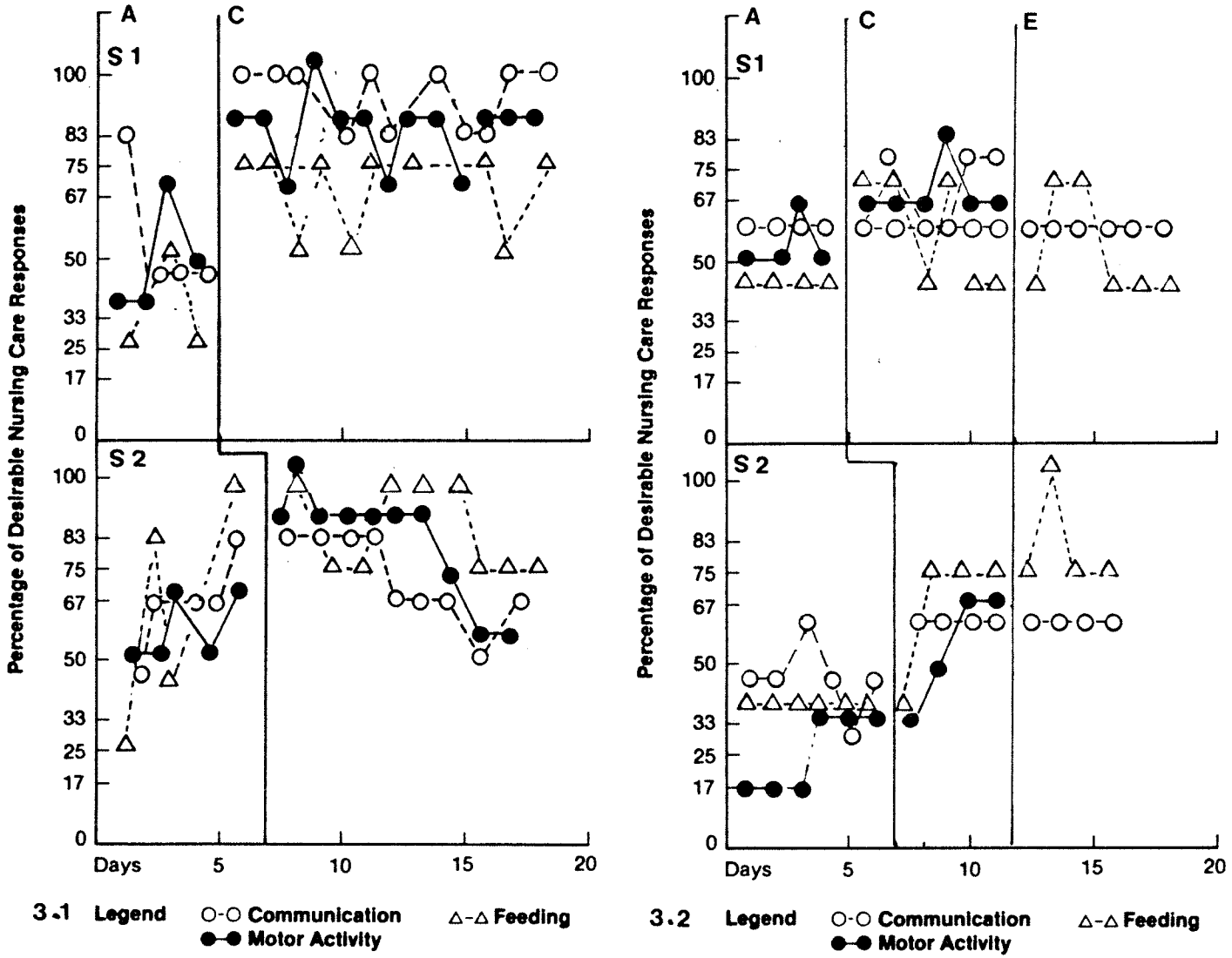

Figure A-7. The AC designs of Experiments 3.1 and 3.2 in which the independent variable was the wheelchair. A change of setting occurred at E.

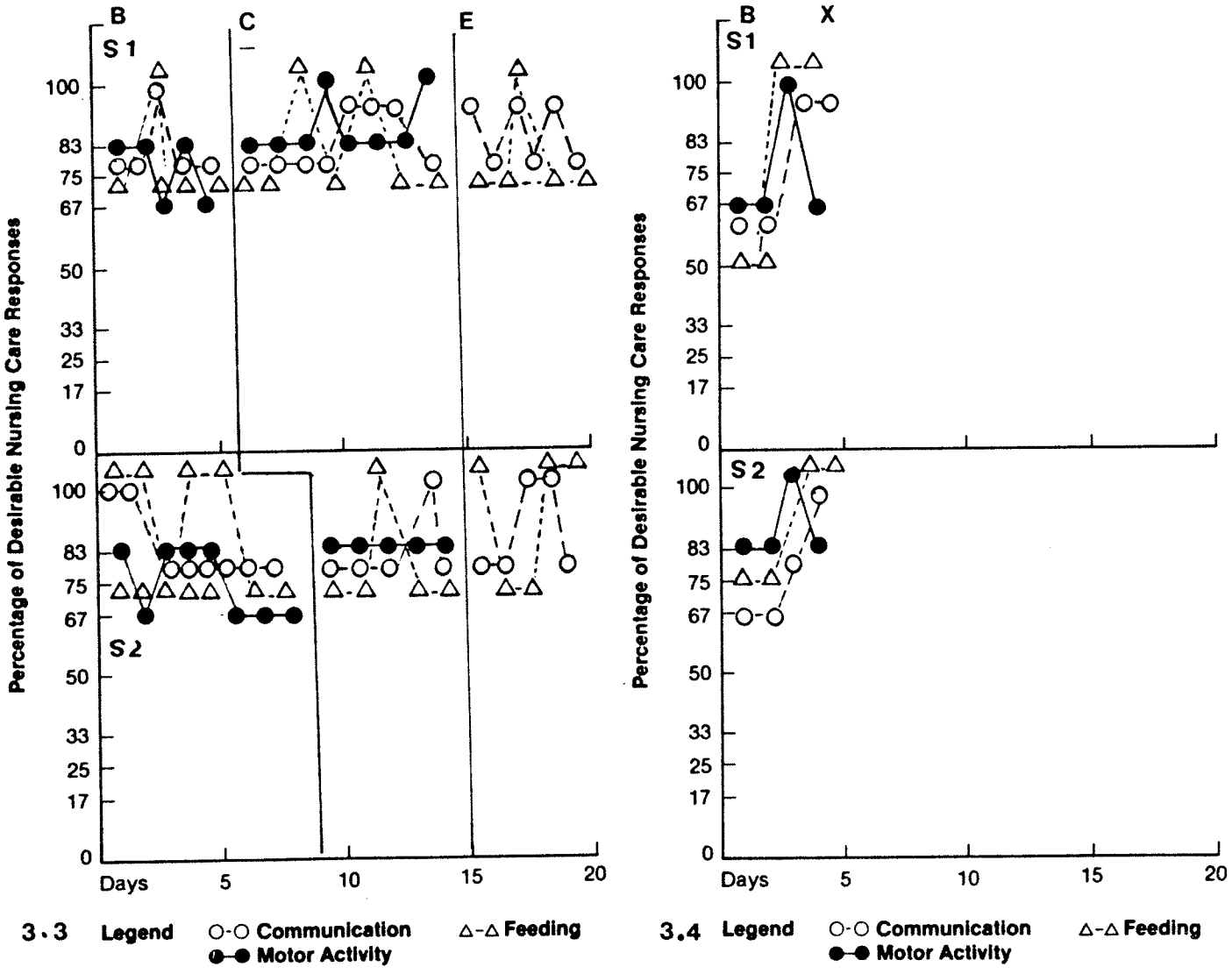

Figure A-8. The BC designs of Experiments 3.3 and 3.4 in which the independent variables were instructions (applied on the first day) and the wheelchair. A change

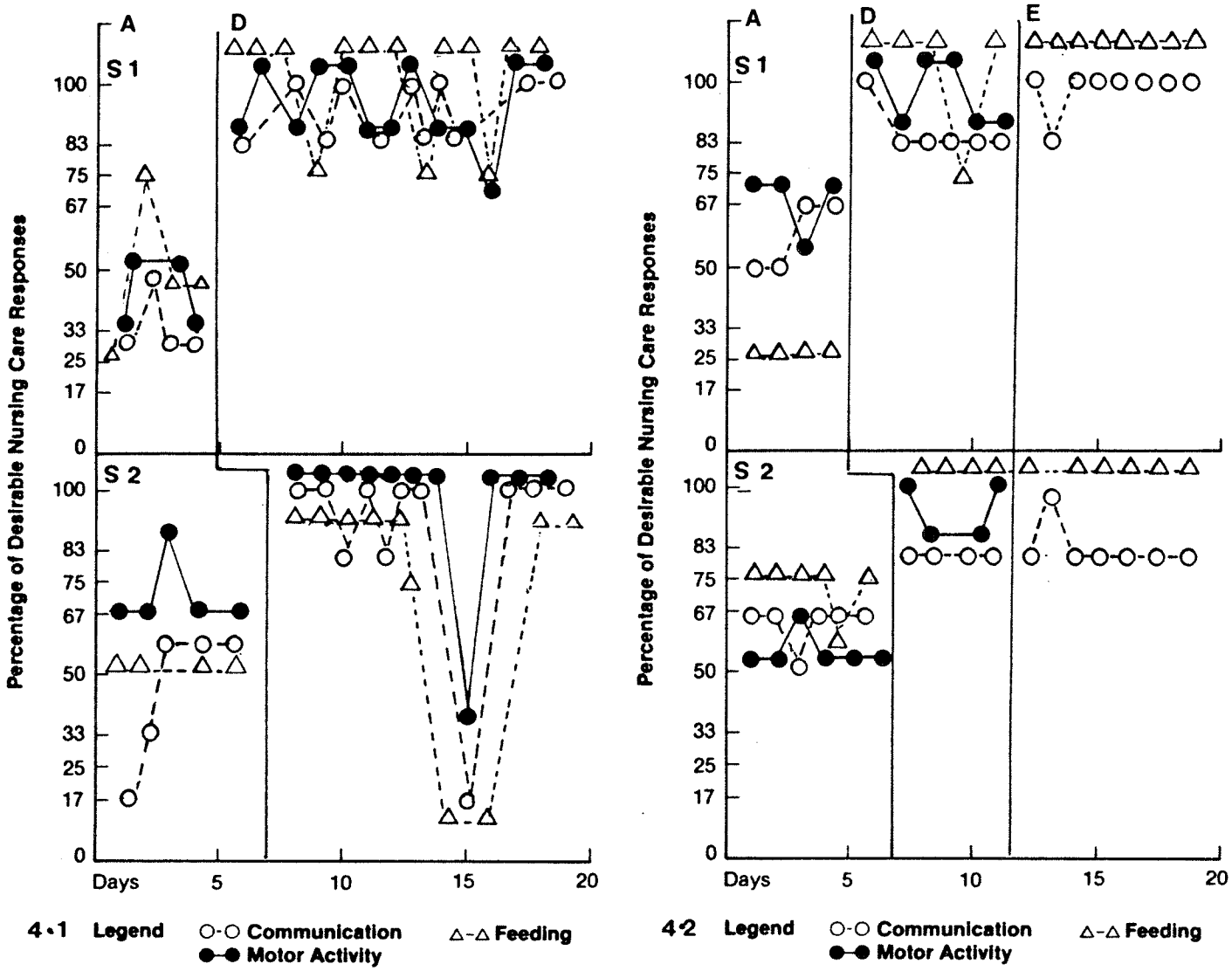

Figure A-9. The AD designs of Experiments 4.1 and 4.2 in which the independent variable was the mat. A change of setting occurred at E.

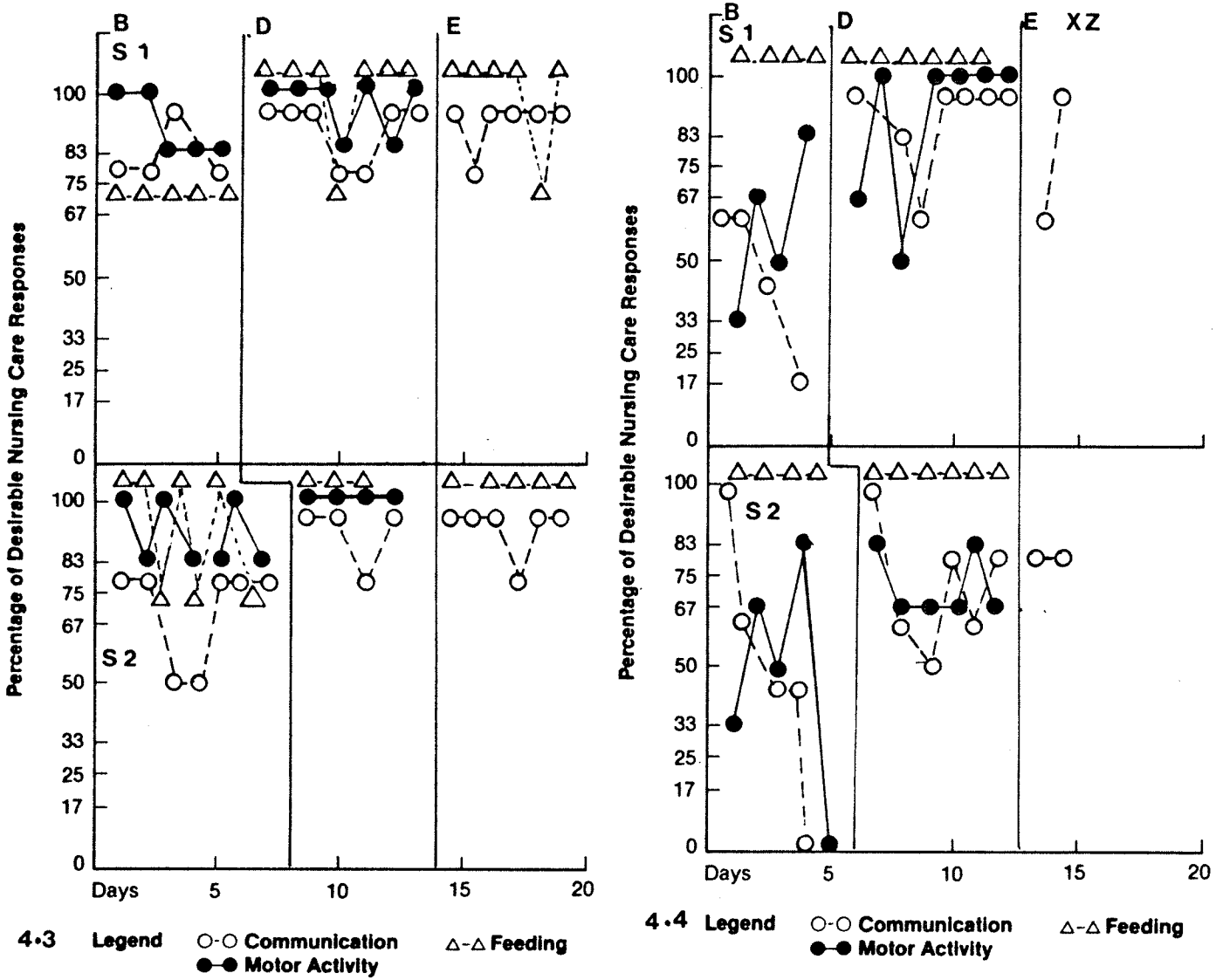

Figure A-10. The BD designs of Experiments 4.3 and 4.4 in which the independent variables were instructions (applied on the first day) and the mat. A change of setting occurred at E, and discontinuance at XZ.

APPENDIX B

Scoring Instructions

Make yourself a small recording graph similar to the ones below on 7.6 x 12.7 cm filing cards obtainable from J. Kellie.

Time	Days: Mon.	Tue.	Wed.	Thu.	Fri.	Mon.	Tue.	Wed.	Thu.	Fri.
7:30										
8:30										
10:05										
10:50										
12:30										
1:30										
	Communication					Motor Activity				

Construct a similar card but with four time slots for feeding which should be sampled at breakfast, lunch, and at mid-morning and afternoon beverage times.

Make a check if a behavior is occurring or a circle if it is not. For motor-activity and communication each observer must sample four times per day (please) with two simultaneous but separate checks to provide for observer reliability checks. These should be made according to the attached schedule. The signals for simultaneous checks may be

mutually arranged with one observer giving the signal throughout. Should the observer not be able to assess the correctness of a subject response, then enter a query and discuss with the head nurse or an instructor. Do not show each other your data cards and leave weekly with J. Kellie. Should one observer be absent the remaining observer will make all checks. Please remember the need for unobtrusiveness and confidentiality.

Observational Classes and Response Criteria

These are three classes of responses made by your colleague nurses whilst giving nursing care to assigned patients who are suffering from developmental and neuro-sensorimotor impairment accompanied by severe physical handicap. The response classes are:

(1) communication and sensory stimulation

(2) motor activity-posturisation including passive exercises, body alignment, and positioning

(3) assisting with, or completely feeding the patient.

The criterion for recording is the desirability of the activities as opposed to undesirability. Desirability is operationally defined as optimum nursing care in the three categories or clear attempts to move towards optimum goals. Undesirability includes non-occurrence of the responses or no obvious attempts to move in the direction of the optimum.

The criteria for desirability or undesirability are those contained in Nancie Finnie, Handling the Young Cerebral Palsied Child in the Home (1977), Dorothy E. Marlow, A Textbook of Pediatric Nursing (1977), Trainex Film Strip, SCN 1022, The Young Spastic Child (1980) and the guidelines on a poster, Feeding the Cerebral Palsied Child, Bloorview

Childrens Hospital (undated), and the assigned patients individual nursing care plan. Do's and dont's are also presented in a series of thirty-five millimetre slides prepared by the instructor, and available on request. The following criteria are not given in your audiovisual and published materials but may not cover all possibilities. In the latter case you should consult either a graduate nurse, the department physiotherapist, a nursing faculty member, or other relevant professional and make a decision retrospectively.

Communication-stimulation is occurring if the subject is interacting in any communicative mode, or any form of physical contact is occurring. A positive score is entered should the subject not be present but has made satisfactory arrangements for stimulation with others. Watching and listening are also positive unless the patient is disinterested and inattentive or if the stimulus materials are unsuitable to the developmental level or sensory modalities of the patient. Sleeping or resting are positive providing it is in a rest period, or the patient is tired or ill, in such cases the patient must be made comfortable and possess a soft toy if it is appropriate, and attendance is available immediately on waking. Over-stimulation of a cerebral palsied young person such as throwing and catching, or teasing producing a non-desirable sensory or motor response are not scored positively. Any form of stimulation is not scored positively should this occur in a relaxation period preceding exercise therapy.

Motor activity-posturisation responses are scored positively if a patient is positioned in a desirable manner relative to the particular activity including resting and sleeping, feeding, reaching and playing, watching and listening, exercising, toileting, bathing, and other care. Handling and carrying must be according to the rules and principles for

spastic, athetoid, and flaccid children advocated by Finnie (1974), and for forms of structural handicap according to principles advocated by Marlow (1977). Deviations from general principles are positive if prescribed in the patient's individual nursing care plan. A subject lifting a patient incorrectly due to their relative physical ratio will be scored positively if the movement is essential for patient health and safety; this will not be scored positively if help is available and not requested. Should posturing and positioning be less than optimum due to inadequacies of equipment, the responses will be scored positively, providing the subject is attempting to improvise.

Feeding is scored positively if the rules for feeding contained in Finnie (1974) or the Bloorview poster are being followed. Should the patient experience difficulties in swallowing in an upright position during feeding, then the position determined to be the optimum will be regarded as correct. Attempts to improvise positional supports in the absence of adequate equipment will be scored positively insofar as positioning for feeding is concerned.

An adaptation of time sampling is used and the observer will be required to pause from his or her task, or leave their task when appropriate if they are not in a position to observe the subject, and will determine at that point in time whether the behavior is occurring or not. Should the subject be merely pausing or moving between materials or patient adjusting the dress, hand washing, recording, and the like the momentary sample will be extended to allow for such activity.

In the event that the subject is legitimately away from his or her task, the observer will resample at the first appropriate time. The observer should enter a query if unable to determine if the behavior is

satisfactory and in such a case must make a retrospective consultation with the graduate nurse, instructor, or physiotherapist.

APPENDIX C

Please answer this paper and oblige:

(1) During the last term do you know if anyone was taking data other than that required for normal course evaluation?

YES NO

(2) If you answer yes, can you indicate who was taking data and when it occurred (please)

APPENDIX D

Short Selection of Role-Reversal Assignments (verbatim)

A. Wheelchair Experience

The experience of being in a wheelchair would have been better if I had not experienced a day on the mat first. The mat was horrible but the best learning experience I have had; it disturbed me emotionally and time stood still. The wheelchair did not drain me in the same way, and did not raise any more empathy. The word for the wheelchair was FRUSTRATING and the worst was being blindfolded. I knew where I was going by the noises and the smells, but people banged my chair without warning, which made me jump out of my skin. The worst experience was feeding myself as you might guess. The meal was spaghetti and meatballs which I could not steer onto a spoon with only my left hand, which of course I could not see. Jean would let me try with a fork as I might have stabbed myself. Another bad experience was being taken to the toilet after the blindfold was removed. Jean got me out of the chair and sat me down without asking me if I needed help, I guess she was too embarrassed. It was not hard to remove my pants with one hand and light a cigarette with one hand, but I burnt my thumb on the end. This made it very hard to clean myself and I was horrified to think I might smear myself and smell. I tried to remove the splint on my right hand but the adhesive was too tight.

There was a lot of fooling around after lunch with people moving me around and leaving me in places like the laundry room. Ron and Debbie kept putting makeup on me like a clown and I became very angry, as I had taken care of Debbie very well on the mat. I felt that the part between ten and one when I was blindfolded, banged into, and feeding and the

toilet was a good experience, but the fooling around after one o'clock spoiled the experience and two of my classmates (but not Jean) left me with an impression of not caring. I found that I did not empathize for others. I guess I was just too angry and frustrated to think of anyone except myself. It was of benefit as I think that I will always tell both a blind person and a person in a wheelchair exactly what I am going to do, and I certainly will not bang a handicapped individual from behind. I also know that meal times are far too rushed and food is not always easy to manage. It also gets all over you and slips down into places where it is difficult for others to see. In conclusion I would like to add that I was terrified of soiling myself before Jean took me to the toilet. I think the assignment would be better if we were allowed to be taken down town after lunch by another student. This would help to cut down on the fooling around and make the experience broader.

B. Wheelchair Experience

I feel that I gained empathy and insight into the plight of the multiply handicapped through this experience in a wheelchair. I gained more out of the experience through persuading my nursing buddy to take me downtown after the specified period, and I promised to do the same for her. The main feeling I had was one of frustration and impatience at having to wait dependent on other people. I think that this might be less in the case of those who have always been dependent and in a wheelchair, I cannot really think what it must be like on Parkhaven unless I could lower myself intellectually to the same level as the residents. My buddy was an excellent and caring nurse but others teased me much worse than they would a resident. I managed to feed myself

hamburgers and french fries fairly well, although I dropped a lot. I could not manage with a spoon so I fed myself with my fingers and went without the creamy dessert (there was no alternative). A "friend" also put a lot of salt in my milk as I could not see what they were doing and this made me vomit causing me embarrassment as I could not clean myself up. This affected me a lot as I thought what it must be like if you soiled yourself waiting to be taken to the toilet. I only went to the toilet once and it was very difficult to manage with one hand, but I really cheated on this as I had no fluids and made sure I went to the toilet before I began the assignment.

One of the worst things was the aches that occurred in my legs and buttocks and I had difficulty in doing anything about it with my right arm (I am left-handed), apart from lifting myself up awkwardly and flopping down.

The trip downtown was good although friends of my mother kept stopping us and asking what had happened. We cheated the experience really as we went to the Mall where it is easy to manage wheelchairs, although the aisles in the stores are too narrow. We also went to MacDonald's where the staff were fantastic, but we knew that they always make the handicapped welcome. A classmate was supposed to pick me up in my car at the Westward Village where he had a beer but the car would not start. We ordered a taxi and the driver would not take us as he said he was not licensed to take handicapped people, so Debbie helped me out of the chair and we took the cab right to the office and complained. We were not charged, and were driven wherever we wanted to go. I learned a lot from the experience but my feelings were not deep as I knew that I would get out of it at the end of the day and felt exhilarated by the

incident with the taxi driver, which helped me to forget the vomit and smells.

C. Mat Experience

One's view of the world changes drastically when verbal communication, the ability to move, and independence are taken away. Being placed in an almost totally dependent role where one has little control over their environment is frightening and frustrating.

Lying immobile on the mats with no direct stimulation intensifed the surrounding environment. Noises that actually exist and are tolerated such as the TV, teeth-grinding, and raspy breathing became sources of irritation. Chairs and people became obstacles and blocked one's field of vision and connection with ward activities. I felt very isolated, as if the world was going on without me.

Total dependence on others for comfort and needs left me feeling helpless. A simple thing such as the elastic coming out of my hair became a problem. I couldn't retrieve it, nor could I retie my hair. The residents must deal with folds in clothing, uncomfortable positions and objects 24 hours a day; I had trouble dealing with five hours.

Juice time left me feeling as if someone had attempted to drown me. I couldn't swallow as quickly as it was poured in, and didn't care for the consequences as it flowed down my chin. The noon meal was more palatable, but not knowing what one was eating, and having to wait for the fork to touch the lips was irritating. I found I was fed too slowly (the converse is often the case on the ward) and didn't enjoy the food. The surrounding environment affected my appetite, ie. the smell of urine, noise, and also the food was cold.

The last half hour and chance to communicate with Bliss Symbols left me with nothing to say. The board didn't allow me to say what I felt.

I feel the experience was excellent and one can learn to understand, if only to a very small degree, what the Parkhaven resident puts up with. As students we were spared some of the more dignity-threatening routines (toileting and bathing) and knew we only had to deal with the situation for five hours.

Through the experience one becomes more aware of what can be done to improve the life and comfort of the residents, and how important little things can be. Lying immobile stressed the significance of human contact no matter how brief - one needs the recognition that someone is there, and that someone does care.

D. Mat Experience

During my experience in Parkhaven, I realized some of the problems experienced by individuals lacking mobility and being nursed flat, and with limited communication skills.

I realized how important it is to ensure that the resident is positioned comfortably, that is, as comfortably as possible, and to frequently change their position if possible. Lying flat, without being able to move due to the splints, and without a pillow is very uncomfortable. My back and joints began to ache soon after I was splinted. Not being able to communicate my uncomfortableness was even worse. I think that is one of the most devastating handicaps. It is one thing to be uncomfortable and to be able to tell someone so that they may try to do something about it, but it was another thing to be

uncomfortable and have to try to communicate this in some way other than speech.

I also realized how dehumanizing and uncomfortable it is to be fed by someone who is cramming the food down your throat, especially blindfolded. It is very so important to take time, if possible, in feeding each and every patient, and also to tell them what it is you are feeding them, not only those with poor or no vision, but everyone. It is terrible thinking that it is a sandwich that you are being fed and have them instead place some salad into your mouth. It ruins the taste of the food tremendously. Also, when feeding someone food that is different temperatures, you should warn them about what the temperature of the food is that you are presently placing in their mouth. I also realized how terrible it feels to have liquids practically poured down your shirt and how difficult it is to swallow lying flat. I ended up with a stomach ache due to indigestion.

In conclusion, I would like to say that this experience is very educational and that everyone who is working in a place where they must feed people should experience it. You really don't know what it feels like until you have been on the receiving end.

E. Mat Experience (This student had English as a foreign language)

The experience of being almost totally immobile and lack of speech was unpleasant one. In the first hour I thought that I will adjust to the situation by applying some relaxation techniques.

As a matter of fact I started to relax by thinking that I am not on Parkhaven, but somewhere else, perhaps in the middle of the ocean, in order to forget for several hours that I am now tied, immobile, can't speak and useless. It did not help. All self behavior modification

techniques did not work on me at this time. I just couldn't relax, possibly because relaxation needs quiet and private environment, that is free of distractions. I did not have private environment. Everybody start to watch me too look at me. I did not have quiet environment. Loud music, TV, children crying, and many many other stimuli.

The bandages on my legs and my hands were applied in such a way that I start to feel them. Feeling of pressure on my skin. For a while I even thought that my blood will stop moving. This forces me to move my legs, hands, and changing positions. I became restless, and perhaps nervous. Trying to get up, but then to lie down again, to rock my body back and forth. The time went slow, very slow. Every five minutes I looked at the time. No much change. There is more to go. I try to fall asleep but without success. At one time I start to make involuntary sounds. I felt as if I can't control myself. I became impatience. This childlike behaviors are manifestations of psychological regression. It was complete regression. Now I can understand my clients, those who confined to wheelchair, why they demonstrate autistic behavior, making sounds. In lunch time I was very hungry. My colleague feed me and I was blindfolded.

It really was frustrating experience. I did not like the food but I did not have a choice. You eat what they serve. Someone else decided for you. Feeling of helplessness. No control of my behavior, of my desires.

After lunch and towards the end, I felt much better. Since now I was close to regain my freedom. When I took my bandage off my hands and legs I had a relief. I started to walk around, to feel my legs, to shake my hands, and take a deep breath. I again myself have choice, be

mobile, and can talk, thank God. But very nurse should do this experience.

APPENDIX E

Verbatim copy, position description, Government of Manitoba, Department of Health, 1984.

NURSING INSTRUCTOR, MENTAL HEALTH 1 and 2

General

This is professional nursing work in a provincial mental health care unit. Employees of this class provide instruction to students enrolled in the two-year Registered Psychiatric Nursing (RPN) program. Incumbents are required to design and implement training courses utilizing accepted psychiatric nursing theory techniques and clinical demonstrations. Supervision is received from senior nursing instructors.

Typical Duties

In consultation with senior personnel, plans the general content of courses offered in RPN program.

Prepares and presents lectures employing acceptable techniques, discussions, demonstrations, reviews, and testing.

Observes, assesses nursing students performance in clinical situations and provides supplementary instruction as required.

Arranges field trips for students.

Prepares and administers examinations, scores papers, maintains class records, evaluates students' performance in verbal and written form.

Participates in staff meetings.

Counsels students as required.

Keeps informed of current developments in field of psychiatric nursing and teaching.

Serves on committees as required.

Performs other duties as assigned.

Qualifications

Knowledges, Abilities, and Skills

Thorough knowledge of professional nursing theory and practice.

Thorough knowledge of the principles and methods of psychiatric nursing.

Good knowledge of teaching methods and techniques applicable to psychiatric nursing.

Ability to relate with the staff, students, and patients.

Ability to communicate effectively in written or verbal form.

Education, Training and Experience

Nursing Instructor 1

Registered Psychiatric Nurse or Registered Nurse with minimum nursing experience of one year; or Bachelor of Nursing.

Nursing Instructor 2

Registered Psychiatric Nurse or Registered Nurse with a university degree, the content of which has relevance to the nursing curriculum, plus one years' teaching experience; or Bachelor of Nursing with six months' teaching experience as a Nursing Instructor 1.

Physical Standards

Physically capable of performing the duties as assigned.