

THE RELATIONSHIP BETWEEN A CHANGE IN ENVIRONMENT (WALL
COLOUR) AND THE FREQUENCY OF AGGRESSIVE BEHAVIOUR OF THE
ELDERLY RESIDENTS OF A NURSING HOME

By

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A Thesis
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in Partial Fulfilment of the Requirements
for the Degree of

Master of Nursing

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DEDICATION

This thesis is due in large part to the support and patience of my husband, Robin. The encouragement he provided in times of great challenge is the reason this project was ever completed.

ABSTRACT

Based on a Conceptual Model for Aggressive Behaviour in the Elderly, this study examined the relationship between a change in colour in the physical environment and the frequency of aggressive behaviour of nursing home residents. Using a quasi-experimental pretest-posttest design, the frequency of aggressive behaviours of twenty-seven cognitively impaired elderly nursing home residents were documented for seven days prior to introducing a change in colour in the environment and for a further seven days following the intervention. The Ryden Aggression Scale Form 1 & 2, the Mini-Mental State Examination (MMSE), the Ward Atmosphere Scale (WAS), and a socio-demographic data sheet were used to collect pretest data; the Ryden Aggression Scale Form 2 (RAS2) was used to collect posttest data.

Results indicate that the frequency of aggressive behaviours before and after the change in colour, tested with Spearman Rank Correlation Coefficient and the Wilcoxon Matched-Pairs Signed Ranks Test did not change significantly. However, the findings suggest there were individual differences in the frequency of aggressive behaviours from pretest to posttest for some residents, although the direction of change varied. The relationship between aggression and cognitive functioning, ward atmosphere, and demographic variables using Spearman Rank Correlation Coefficient and Chi-Square were not significant.

A scatterplot indicated that both non-aggression and aggression were associated with impaired cognitive functioning.

Some support for the Conceptual Model for Aggressive Behaviour in the Elderly, which guided this research, is demonstrated in the findings and suggests utility of the model in clinical settings. Further research exploring the impact of learned responses, cognitive functioning, environment, and nursing behaviours on aggressive behaviour is necessary.

Acknowledgements

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I. STATEMENT OF THE PROBLEM

Aggressive behaviour has fascinated researchers for more than one hundred years. This behaviour has been studied in a variety of populations including children, juveniles, adults, psychiatric patients, and psycho-geriatric patients (Baron, 1972, Hilgard, Atkinson, & Atkinson, 1979, Schauss, 1979). Many studies suggest that aggressive behaviour is a result of the environment, both its physical aspects and its psychosocial aspects (Baron, 1972, Brehm, 1966, Desor, 1972, Lanza, Milner, & Riley, 1988, Meddaugh, 1990, Morrison, 1990, Standing & Stace, 1980). To date there have been no studies which explore the role that environment plays in the expression of aggressive behaviour of elderly persons in long term care facilities. The environment is filled with essential information needed to make accurate predictions about human behaviour (Moos, 1974, p.21).

Aggressive behaviour can compromise the quality of life and care needs of the frail and dependent residents of facilities for the elderly. Nursing staff are often the target of aggressive behaviour and the behaviour has an impact on work satisfaction, work attendance, and the therapeutic milieu (Bolger et al, 1988, Cumming, Cumming, Titius, Schmelze & MacDonald, 1982, Feldt & Ryden, 1992, Meddaugh, 1990, Moos, 1974, 1976, Munns, 1985, O'Driscoll & Evans, 1988, Ryden 1992, Winger & Schirm, 1989). Nursing

staff in these facilities prefer to prevent the occurrence of aggressive behaviour and intervene effectively when it does occur (MHO, 1990).

The link between aggressive behaviour and the environment has been demonstrated in school age children, college students, prison inmates, psychiatric inpatients and adults (Baron, 1972, Brehm, 1966, Brehm & Brehm, 1981, Desor, 1972, Munns, 1985, Schauss, 1979, Standing & Stace, 1980). While aggressive behaviour of the elderly residents of nursing homes has been described, these descriptions have tended to neglect the environmental setting as a factor associated with aggressive behaviour (Beck, Baldwin, Modlin & Lewis, 1990, Boettcher, 1985, Bolger et al, 1988, Chrisman, Taber, Whall, & Boehm, 1989, Cohen-Mansfield, Marx & Rosenthal, 1989, Cumming et al, 1982, Kingdom, 1992, Meddaugh, 1990, Rockwood, Stolee & Robertson, 1989, Ryden, 1988, Ryden, Bossenmaier & McLachlan, 1991, Winger & Schirm, 1989). Other studies that have explored the influence of the environment on elderly persons have not focused on the effects of environment on aggression (Cluff, 1990, Kayser-Jones, 1989, Kolanowski, 1992, Lawton, 1980, 1989, McCracken & Fitzwater, 1989, Roberts & Algase, 1988).

This study was an attempt to shed light on the relationship between the physical environment and aggressive behaviour in elderly residents in a nursing home. Specifically, this study explored the impact of colour on

aggressive behaviour of elderly residents of nursing homes. Knowledge gained from empirical research on the relationship between the environment and aggressive behaviour can be applied in practice settings to enhance the quality of life for residents and increase work satisfaction for caregivers.

The specific research objectives were:

- 1) To measure the frequency of aggressive behaviour before and after a change in the physical environment.
- 2) To examine the relationship between cognitive functioning and aggressive behaviour.
- 3) To examine the relationship between ward atmosphere and aggressive behaviour.

In addition the relationship between aggressive behaviour and selected socio-demographic variables including age, gender, length of stay, diagnosis, and number of medications were explored.

II. LITERATURE REVIEW

The literature on aggressive behaviour is very extensive and dates back to the early 1900's. The diversity of topics related to aggressive behaviour is so vast that the scope of this review will be limited to those publications concerned with the concepts of aggressive behaviour, aggressive behaviour in the elderly, and influences in the physical environment that produce aggressive behaviour. This review will be organized as follows:

1. Aggressive Behaviour as a Learned Response.
2. Aggressive Behaviour : Description and Prediction
3. Aggressive Behaviour in the Elderly
4. Aggressive Behaviour: Staff Behaviour as a Contextual Factor
5. Aggressive Behaviour and Cognitive Functioning
6. Aggressive Behaviour and The Influence of the Physical Environment

1. Aggressive Behaviour as a Learned Response

Several theories have been developed to explain or better understand aggressive behaviour as a learned response. The contributions of Lanza (1983), Boettcher (1983), Brehm (1966) and Meddaugh (1990) are notable. In

particular, Lanza's work has guided much of the thinking in this area.

All individuals have the potential for aggressive behaviour expressed through interactions with the environment (Lanza, 1983). Modelling as described in social learning theory is the process by which a child learns behaviours by observing and imitating others (Hilgard, Atkinson & Atkinson, 1979). Modelling of physical and verbal aggression, along with reinforcement from the environment, leads to the acquisition of aggressive behaviours. When this behaviour is expressed, the aggressor perceives a consequence, either positive or negative, which may support further expression of this type of behaviour.

Lanza (1983), has proposed a "Theoretical Model for Aggression" which is intended to simplify, categorize, and promote an understanding of various aspects of aggression and their interrelationships (Appendix 1). The model is based on the literature on aggression, dating back to 1905, depicting the behaviour as a human phenomenon rather than an age specific phenomenon (such as children, teenagers, adults, or the elderly). Embedded in the model is the assumption that cognitive functioning is intact.

Lanza (1983), suggested that both innate factors and those from the human-environment interaction contribute to a person's potential for aggression. Aggressive behaviour is learned through modelling and is reinforced by the

environment (Lanza, 1983). The model further suggested that the aggressive individual's perception of the consequences of aggression determines future aggressive acts.

The model is very detailed and complex. Unfortunately, the model does not indicate the degree of influence each of the origins has on the manifestations and it further fails to define clearly how it can be used by nurses in clinical practice. (See Appendix 1 for a graphic representation of the model which identifies the origins of aggressive behaviour as four innate factors and three interactions with the environment.)

Much of the aggressive behaviour research has focused on the violent behaviour that occurs in psychiatric institutions. Lanza's (1983) model deals only with aggression suggesting a conceptual distinction from violence. Aggression is defined as an offensive action or procedure while violence is defined as the exertion of physical force so as to injure or abuse (Webster, 1971). However, the two words are used almost interchangeably in the literature making comparisons of studies difficult. The research conducted in psychiatric settings concerning violence must be carefully examined for its applicability to aggressive behaviour in elderly residents of nursing homes.

According to Boettcher (1983), violence is defined as one of several subcategories of aggression. Violence is a very powerful way to communicate an intense human need. (Boettcher, 1983). The examples of violence presented by Boettcher (1983) include any event in which a patient struck, shoved, hit, yanked, grabbed, punched, kicked, bit, threw something, pulled hair, or tore at clothing in an "aggressive" manner. Need Theory was used as a foundation to describe an "Integrated Theoretical Model for Nursing" (Boettcher, 1983). The person displaying aggressive behaviour perceives that one or more needs have been blocked. Perceptions of unmet needs may be at the conscious or unconscious level. For example the need for greater personal space, where the need itself is recognized and the integrity of the self-system is threatened (Boettcher, 1983). As anxiety and tension increase, the person resorts to behaviours which previously provided a sense of self mastery and control over these troubling feelings. Violent behaviour may have been nurtured in the past or the individual may have been the victim of physical abuse and may never have learned a more acceptable way to obtain this sense of mastery and control (Boettcher, 1983). Organic problems, for example dementia, disturb the ability to tolerate need deficits or may intensify needs beyond the usual norms and increase the tendency to use aggression to express this need (Boettcher, 1983).

Boettcher's model emerged from work in psychiatric settings and caution is warranted in using this set of assumptions to aggressive behaviour of chronically ill older adults in long term care settings. Nevertheless, this model presents some useful insights, such as how identification of an underlying factor, that of an unmet need, might lead to expression of aggressive behaviour.

Aggressive behaviour might be used in some settings to satisfy the needs of the individual, if the aggressive behaviour was effective in the past for satisfying a need (Boettcher, 1983). This work considers psychiatric illness as a factor without clarifying the amount of cognitive impairment. It will be necessary to explore the application of this interpretation of the literature in other settings as the ideas are presented from the perspective of persons with psychiatric illness who display aggressive behaviour while in hospital. The model needs to be subjected to rigorous scientific study to identify its utility in explaining violent, or aggressive, behaviour.

Taking a slightly different perspective on aggressive behaviour as a learned response, Meddaugh (1990) suggested that Reactance Theory, the work of Brehm (1966), predicts that people will respond with aggressive behaviour if the freedom to choose behaviours which will maximize need satisfaction are limited. Brehm (1966) has suggested that

freedom of behaviour is an important aspect of human life. Although choices are sometimes limited, people perceive personal freedom in choosing their behaviour (Brehm, 1966).

Reactance theory proposed that with appropriate freedom, one chose behaviour that maximized need satisfaction (Brehm, 1966). When this freedom was threatened or reduced, a person may respond as if that threat were a barrier to one's personal freedom (Brehm, 1966). This response to the reduction (or threatened reduction) of a person's potential for acting, considered a counterforce for acting, was called "psychological reactance" (Brehm, 1966, p.2).

Reactance Theory was developed over time in several laboratory experiments. Choices were restricted by the experimenter and the response of the subject to these restrictions was measured. Aggressive behaviour was not specifically considered in the original work but findings indicated that the more important a free behaviour is to an individual, the greater the magnitude of reactance (Brehm, 1966). Meddaugh (1990, 1991) used this work to guide two qualitative studies of aggressive behaviour in elderly residents of nursing homes, although the original work did not speak to the impact of cognitive impairment.

The influence of the physical environment was a peripheral consideration in the laboratory settings used to develop Reactance Theory. The value Reactance Theory has

for this current study is to reinforce consideration of the psychosocial environment as a setting which limits free behaviours of individuals and as such may contribute to a "reactance response" in the residents. The magnitude of this response may be interpreted as aggressive behaviour.

Brehm and Brehm (1981) reviewed all the studies that had been conducted by several disciplines in the years between the original work, 1966, and 1981. Based on this review, the basic motivational processes to maximize satisfaction that are addressed by Reactance Theory are assumed to be ubiquitous (Brehm & Brehm, 1981) that is existing or being everywhere at the same time, omnipresent.

Summary

The potential for all human beings to display aggressive behaviour is reinforced by Lanza (1983), Boettcher (1983), Meddaugh (1990, 1991) and Brehm (1966). These approaches, focused as they are on individual processes, seem inadequate as explanations for aggressive behaviour that occurs in the nursing home setting. The perspective needs to be expanded to include the social and physical aspects of the environment as well as the impact that cognitive functioning, individual learning and motivation have on aggressive behaviour.

2. Aggressive Behaviour: Description and Prediction

Research on aggressive behaviour has been conducted for decades in several settings and with diverse subjects. The Nursing studies of aggressive behaviour have been limited, until recently, to explorations of the violence in psychiatric settings. A small number of studies describing aggressive behaviour and violence, along with studies attempting to identify factors that can predict expression of aggressive behaviour, will be included in this review. Notably studies by Munns (1985), Morrison (1988), Lanza, Milner and Riley (1988), Rix and Seymour (1988), Blomhoff, Seim and Friis (1990), Convit, Isay, Otis and Volavka (1990), and Lanza and Campbell (1991) are presented as the central works describing aggressive or violent behaviour and predicting the expression of aggressive behaviour. The decision to limit the exploration of the psychiatric literature is based on the assumption that the criminally insane and acute psychiatric clients are a population with unique characteristics largely unlike the elderly populations of nursing homes. Given the disparity between psychiatric patients and elderly residents of nursing homes, only selected studies have been included in this review.

Central to this research is the nursing definition or diagnosis of violent behaviour. The nursing diagnosis

"Potential for Violence" has been included on the taxonomy list of North American Nursing Diagnosis Association (NANDA) (Munns, 1985). In fact, Munns' (1985) study was designed to validate the defining characteristics of the nursing diagnosis "Potential for Violence". Examples of these defining characteristics include overt and aggressive acts; body language including clenched fists, rigid posture, and tautness; rage; and self destructive behaviour (Munns, 1985). A sample had been drawn from a large psychiatric facility: one acute care unit and one long term care or nursing home unit. A retrospective chart audit of thirty subjects validated the following defining characteristics:

1. body language: clenched fists, rigid posture, or tautness
2. hostile threatening verbalizations
3. increased motor activity
4. overt and aggressive acts
5. suspicion of others (Munns, 1985)

The retrospective chart review has been a common method used to study aggression or violence but the data obtained are limited by the quality and quantity of records kept by the nursing staff on the units being studied. Several limitations were inherent in this study including those relating to: the knowledge and experience of the staff creating the record; the staff-patient ratio; prior knowledge by the staff that the study would be done; and the

population mix on the units at the time of the study. Unfortunately the report to NANDA did not address these limitations.

The issues related to measurement of violence in psychiatric settings were identified in a literature review written by Morrison (1988). The overuse of indirect measures of violence such as incident reports and the lack of psychometric testing of direct measures of violence has lead to random sources of error and has limited seriously the use of a study (Morrison, 1988). Incident reports have tended to reflect the reporting behaviour of the staff of a particular unit and are likely a poor representation of frequencies due to high rates of under-reporting.

Two direct measures of violence were examined in this review: the Behavioural Rating Scale (BRS), and the Overt Aggression Scale (OAS). The BRS results are interval level data and the OAS produce nominal level data. It was Morrison's (1988) view that the psychometric testing potential of both of these tools has not been demonstrated. In addition, a strong theoretical base will be needed to conduct more studies on violence and aggression from which empirically tested research instruments can be generated (Morrison, 1988).

The issues raised by Morrison (1988) about the literature on aggression and violence havw been echoed in

the literature on aggressive behaviour in long term care settings. Definitions of aggression, violence and assault have overlapped, clouding conceptual differences. Furthermore, aggression, violence and assault have been measured using the same or similar tools.

"Predictors of patient assault on acute inpatient psychiatric units" was a pilot study designed to empirically examine predictors of violence with violent assault (Lanza, Milner, & Riley, 1988). Lanza's Theoretical Model for Aggression (1983) was modified to identify predictors of assault and other outcomes (Lanza et al, 1988). Personality factors, situational factors, and interactions between personality and situation were considered essential to predicting a commission of assault.

A nurse researcher attended daily patient/staff rounds to make direct observations about patients, both assaultive and non-assaultive, using a two page inventory tool developed for this study. The next day, the nurse researcher collected data on the actual behaviour that had been displayed by each patient in the last 24 hours. Two variables identified in the patient/staff rounds: increased motor activity; and strong aggressive drives in psychological testing were significantly related to patient assaults which occurred later the same day (Lanza et al, 1988).

Unfortunately, the research protocol was not clearly outlined making it difficult to understand how the study was related to previous work in this area. The lack of descriptions of how the data were collected, or why the data were analyzed in the way that they were, made it very difficult to interpret the results.

The process used to develop the two page inventory tool and to establish reliability and validity for the tool was not included in the report. The suggestion, however, of predicting future behaviour based on direct observations is worthy of careful exploration as it could facilitate planning and management of nursing care for those individuals who display aggressive behaviour.

A study of the violent incidents in a regional secure unit, in Great Britain, rated incident reports from the previous year according to the severity of the outcome (Rix & Seymour, 1988). The conclusions reached were that only a few patients commit the majority of the incidents; nurses were most often the victims; and threats were more common than actual assaults. A concern raised by the researchers was the underreporting of incidents. They estimated that only 20% of all incidents are formally reported, raising serious questions about those incidents that are not reported. A suggestion was made to conduct direct observation studies to assess more accurately the magnitude

of the problem (Rix & Seymour, 1988). A previous history of violence was not a predictor of violent behaviour while on the unit. Student nurses were least often assaulted, a fact explained by the researchers as a function of the setting in that students are not expected to provide care for unstable and violent patients (Rix & Seymour, 1988). The methodology, of retrospective incident report review, has been criticized as being very weak (Morrison, 1988).

Another retrospective study of violent psychiatric inpatients attempted to identify factors that would facilitate the prediction of such violent events (Blomhoff, Seim & Friis, 1990). Previous studies had suggested that violent behaviour before admission was the most common predictor of violence after admission but if it was used alone to predict violence, false negatives were reported (Janofsky, Spears, & Neubauer, 1988). The demographic variable "violence in the family of origin" was used to correctly separate patients into violent and non-violent groups (Blomhoff et al, 1990). A high level of aggression before admission along with an absence of anxiety strongly predicted violent behaviour and previous violence was the single best predictor (Blomhoff et al, 1990).

The data for this study were collected in Oslo, Norway in 1985 and 1986. A review of medical records, including incident reports, of all patients in the previous year who

had committed violent acts on the unit and the first 34 non-violent patients who were admitted to the unit in the same time was conducted. The ward milieu was measured using the "Ward Atmosphere Scale" and the violent acts were quantified using the "Overt Aggression Scale". Violence was defined as physical aggression directed at another person.

The strength of this study lies in the fact that direct observations were recorded on the medical record by a physician. Each patient was assessed according to specific criteria and then the entire hospital admission was reviewed for presence or absence of violent incidents (Blomhoff et al, 1990). The staff on the unit knew that the data collection was occurring which may have heightened awareness and improved the quality and quantity of records.

The ward milieu, an emergency unit, was measured using the "Ward Atmosphere Scale" once during the one year of data collection, suggesting that this was a stable factor in the study. The Overt Aggression Scale has been criticized for lack of psychometric testing and for providing only nominal data (Morrison, 1988). Information about either tool is absent from the report, which once again makes interpretation of the results difficult.

The report gives very few details about the unit itself, the staffing patterns, the professional to non-professional mix, or the general population of the unit. It indicates only that the study took place on a 16 bed

emergency unit. The emergency unit in the Canadian context is considered ambulatory care with any patients requiring admission being transferred to the appropriate unit. It is difficult to envision the unit under study from the brief description provided. It is questionable whether such an environment could be described as stable over a one year period.

Incident reports of fights and assaults were reviewed in a study designed to compare two groups: those who were repeatedly violent (recidivist) and those who were violent only once or twice (non-recidivist) (Convit, Isay, Otis, & Volavka, 1990). A fight was defined as a violent incident where two patients were physically harming each other. An assault was a physical attack on another patient but the victim did not fight back. The role played by the patients in the fights or assaults were coded as attacker, victim, or unclear. (All reports with unclear roles were excluded from the study but the number of excluded reports is not revealed.)

A startling 53% of all incidents of violence were committed by 5% of the subjects (70 of a possible 1,552 patients)(Convit et al, 1990). Further, 70% of the assaults by women were committed by 8% of the women in the hospital while 40% of male assaults were committed by 3% of the men in the hospital (Convit et al, 1990). Recidivist women had

the same mean age as recidivist men and were significantly younger than non-recidivist women (Convit et al, 1990). The percentage of women classified as recidivist was higher than the percentage of men (Convit et al, 1990).

The researchers reported analysis of the relative rates of violence among psychiatric inpatients rather than the actual base rates of violence believing that the contrasting of the recidivist and non-recidivist groups reduces the concern of underreporting of incidents. This holds true however, only if underreporting is not systemic for a given group of patients.

It would seem that the entire data pool was based on incident reports and there was no evidence to compare pre-study reporting rates with the reporting rates during the study. Specific information about the incident report in terms of when it was completed, by whom it was completed, or what details of the event are included on the incident report were not provided. The reader is not certain if environmental factors or any preceding events are recorded in the report which would provide a context for the violent incidents. The findings of this study seem to lend support to the idea that a small number of inpatients commit the majority of violent acts, but further exploration using more rigorous methodology is essential.

The approaches to psychiatric care have changed in the past decade to include more effective psychotropic medications; increased community-based treatment programs; and assertive legal-judicial initiatives (Lanza & Campbell, 1991). This has led to changes in the populations of state psychiatric hospitals such that the patients are younger, more acutely ill, and more assaultive. Many studies have suggested that formal reports of assault represent as little as 20% of the actual number of assaults (Lanza & Campbell, 1991).

Two different reporting methods were compared to facilitate identification of strategies to increase the rate at which assaults were reported. The nursing staff of the facility under study communicated to oncoming shifts using a daily ward report designed to communicate important issues and events over the last eight hours. These daily ward reports were scrutinized for assaults, agitated behaviour, and combative or threatening verbal and physical behaviour, over a six month period without the nursing staff being made aware that the data were being collected. The formal incident reporting procedure required all serious assaults to be reported and was not modified in any way during the study period.

The results indicated that more serious acts of aggression were being recorded on incident reports while the less serious physical assaults and verbal aggression were

recorded on the daily ward report. The conclusion drawn was that a wider definition of an incident, as well a more efficient reporting system, produced a more comprehensive picture of the range of assaultive or aggressive behaviours on a unit and improved the reporting rate (Lanza & Campbell, 1991). The underreporting of incidents suggested in the literature was not supported by the results of this study. Instead there was an indication that nursing staff discriminate between serious and less serious incidents and only report those which require closer follow up and more complex problem solving.

Summary

An increase in motor activity (Munns, 1985, Lanza et al, 1988), violence in the family of origin, previous displays of violence, and high levels of aggression coupled with an absence of anxiety (Blomhoff et al, 1990) emerge from this review as factors which might predict aggressive behaviour, assault or violence. None of these studies explored or included physical aspects of the environment as a possible predictor of this behaviour. Indeed none considered the physical aspects of the environment in attempting to describe or predict the expression of aggressive behaviour.

The descriptions of the behaviour varied from aggressive behaviour to assault to violence using these terms interchangeably and conceptually clouding

understanding of this behaviour. In addition, the inconsistent use of measurements of the behaviour including both indirect incident reports and direct observation tools makes comparison of the results difficult at best.

The finding that only a small number of patients are responsible for most aggressive incidents was repeated in two studies (Convit et al, 1990, Rix & Seymour, 1988) however, these studies used different methods for obtaining these results.

Little or no investigation of the effect of the physical environment as a predictor on aggressive behaviour has been done although there is at least one theoretical model which suggests that the physical aspects of the environment explain some of the origins of this behaviour (Lanza, 19983).

3. Aggressive Behaviour in the Elderly

The aggressive behaviour exhibited by the elderly residents of long term care facilities differs from the aggressive behaviour of psychiatric patients, young offenders, and prison inmates considered in the description and prediction section of this review. The episodic nature of this behaviour (Cumming, Cumming, Titus, Schmelzle & MacDonald, 1982), the suggestion that aggressive behaviour is positive coping (Letemendia, 1985), and its similarities

to agitation (Cohen-Mansfield, 1986, Struble & Sivertsen, 1987) are described here. The characteristics of aggression and its relationship to other factors (Evans, 1987, Winger, Schirm, & Stewart, 1987, Rockwood, Stolee & Robertson, 1989), such as time of day (Cohen-Mansfield, Marx & Rosenthal, 1989) and touch (Marx, Werner & Cohen-Mansfield, 1989) will also be presented. Finally the differences and similarities between aggressive and non-aggressive cognitively impaired institutionalized elderly are described (Meddaugh, 1990, 1991) including those factors that are thought to contribute to staff abuse of these residents.

The staff within facilities may exert pressure on their administrators to transfer elderly residents whose behaviour deviates too far from the "acceptable level" (Cumming et al, 1982). Transfers into or out of one system or the other requires the approval of a central officer in the Ministry of Health in the province of British Columbia. The Government of British Columbia explored the possibility of building a number of fifty (50) bed facilities to accept the transfers of patients whose behaviour "deviates too far from the acceptable".

The staff of facilities in British Columbia were asked to identify the patients who were the most challenging; to describe the troublesome behaviour; and to nominate patients for transfer if such a facility were available. A total

population of 4250 elderly persons in extended care unit's (ECU) and long term care (LTC) in the province were included in the study. Only three per cent (3%) of the patients in the system were nominated for transfer, supporting other work in this area suggesting that only a small number of patients are responsible for the majority of violent acts (Cumming et al, 1982, Convit et al, 1990, Rix & Seymour, 1988). A follow up was done two months later on the same population, using the same approach. A slightly higher number of patients was nominated during the follow-up, but only approximately 1% were the same patients who had been nominated initially. A third, telephone, follow up done on all patients who were nominated at time one and time two found that one third had lost their nomination for transfer. This was interpreted, by the researchers, as evidence that difficult behaviour is cyclical or is an episode of staff intolerance (Cumming et al, 1982).

The types of behaviours that were identified by the staff as being troublesome were: intrusive behaviour (noisiness, wandering, or demanding); aggression (physical and verbal); psychiatric symptoms (depression, paranoia, or neurosis); resistance to the facility rules (tobacco and alcohol use); and willfully unacceptable behaviour (exhibitionism, or deliberate smearing)(Cumming et al, 1982). The elderly subjects of this study had not demonstrated the serious, frightening, violent behaviour

that is described in the psychiatric settings but it was behaviour which had not responded to management strategies. The researchers concluded that development of segregated units was not necessary as difficult behaviour, because of its cyclical nature, would simply "go away" given enough time (Cumming et al, 1982).

"Behaviour is a complex product of genetic determinants and social learning" (Letemendia, 1985). Aggression in the elderly can be seen as an appropriate response in some situations and may be a more effective coping strategy than either helplessness or fear. Letemendia (1985), suggested that clinical psychology can be used to understand the factors that influence aggression and can provide methods of managing the behaviour in both normal and demented elderly persons. Techniques for management such as observation and analysis, altering consequences, counselling and identifying alternative behaviour were suggested for use with the "normal" elderly person. The demented elderly person lacks insight and the ability to learn simple associations and thus techniques such as anticipation and avoidance of situations leading to aggression, distraction to something pleasant in the environment, and medication to reduce arousal may be needed. Letemendia's (1985) article was an anecdotal account of why aggressive behaviour occurs in the elderly residents of

institutions and was intended to provide practical guidance in managing the care needs of such residents. The origins of the behaviour were not referenced and case studies of applications are not included in the report. The value this article is its suggestion that the aggressive behaviour is positive coping behaviour which needs to be channelled into more socially acceptable forms of expression. The theme of aggressive behaviour as positive coping has been raised by others in the literature and is reinforced in the clinical context (Boettcher, 1988, Brehm, 1966, Lanza, 1983).

Agitation has been described as behaviour such as inappropriate verbal, vocal, or motor activity which is not due to confusion or apparent need (Cohen-Mansfield, 1986). The agitated behaviour of 66 cognitively impaired elderly living in a nursing home was observed using a tool developed for this purpose (Cohen-Mansfield, 1986). Examples of agitated behaviour included cursing, biting, and fighting. Agitated behaviour was manifested in a nursing home environment in three syndromes: aggressive-physical, aggressive-verbal, and non-aggressive. The non-aggressive syndrome was the least disruptive behaviour on the unit but was the most frequently occurring syndrome (Cohen-Mansfield, 1986). The Cohen-Mansfield Agitation Inventory (CMAI), the Rapid Disability Rating Scale, and the Brief Cognitive Rating Scale were used in an attempt to link cognitive

impairment with agitation (Cohen-Mansfield, 1986). Only behaviours that occurred several times a day were included in the study. Several agitated behaviours were found to co-exist: spitting with hitting and biting; and cursing with hitting and constant requests for attention. The report could not, however, link these behaviours to the level of cognitive functioning.

Agitation is a symptom found often in elderly confused patients with organic brain changes (Struble & Sivertsen, 1987). This agitation can escalate into aggressive, violent behaviour threatening the safety of both the individual and others (Struble & Sivertsen, 1987). Assuming that agitation was an episodic behaviour which occurs once or repeatedly, but not continuously, Struble and Sivertsen's (1987) study was designed to examine agitated behaviour associated with nursing interventions.

Nurses recorded on a checklist four categories of behaviour that resulted in the nurse giving a psychotropic drug or restraining the resident. The categories included psychomotor behaviour, aggressive/antisocial behaviour, speech patterns, and physiological behaviours. Increased generalized movements occurred in all 23 subjects of this study and was considered an early warning sign of agitation (Struble & Sivertsen, 1987). Aggressive/antisocial behaviours were promptly attended to by nurses, within five

to fifteen minutes, whereas nurses responded to other agitated behaviours within 30 minutes to three hours (Struble & Sivertsen, 1987).

The most common category of behaviour was psychomotor behaviour, followed by speech patterns, aggressive/antisocial behaviour, and finally physiological behaviour. Definitions of the categories provided in the report were vague and the checklist used to record the behaviours was not included. The strength of the study lies in direct observations of behaviours recorded by staff at the time they occur. There was no mention of assessment of environment, although the report acknowledges that overstimulation, understimulation, and misinterpretation of the environment may occur in confused elderly patients.

Sundown syndrome, an increase in restless and verbal behaviour as evening approaches, was studied in attempt to describe the relationships of this behaviour to psychosocial, physiologic, and environmental factors (Evans, 1987). Behaviours considered to exemplify sundown syndrome included wandering, scratching, banging, screaming, calling for help, and so forth (Evans, 1987). The findings supported the existence of sundown syndrome by demonstrating an increase in these types of behaviours in the evening. Mental impairment, social isolation, and limited activities

were associated with sundown syndrome as was visual impairment and low environmental light (Evans, 1987).

The behaviour in Evans (1987) study was clearly agitation not aggression, although other studies of agitation have included aggressive behaviours (Cohen-Mansfield, 1986). The implication that physical environmental factors was related to agitated behaviour, which may or may not include aggressive behaviour, is important to note. Further, conceptually confusing aggressive behaviour with agitation continues to make comparison of findings difficult.

A study designed to describe the incidence of aggression, the characteristics of aggression, and how this behaviour related to such factors as length of stay, health status, functional dependence, and perception of control over daily situations by aggressive patients was conducted in the long term care areas of a veterans facility (Winger, Schirm, & Stewart, 1987). A total of 101 subjects who resided in either the nursing home unit or the extended treatment unit participated in the study. Tools such as the Mental Status Questionnaire (MSQ), the Katz Index of Activities of Daily Living (ADL), the Situational Control of Daily Activities (SCDA), and the newly developed Behaviour Inventory (BI) were used to collect data. The frequency of aggressive behaviour was found to be 91% for the nursing

home unit and 66% for the extended treatment unit. The aggressive residents had longer lengths of stay, lower MSQ scores, and less control over situational activities (Winger et al, 1987). The more functionally dependent nursing home patients, as measured using the Katz Index of ADL, demonstrated the most serious aggressive behaviours that were injurious to self and others. Almost all behaviour that endangered self or others was present in combination with disturbing behaviours (Winger et al, 1987). The participants of this study were almost entirely male, all veterans, and retained orientation to person and place. These are characteristics which were unique to the setting of the study, limiting the generalizability to other settings.

Long term care residents of Saskatchewan were surveyed in 1981 to determine the prevalence and characteristics of problem behaviour (Rockwood, Stolee & Robertson, 1989). A stratified random sample of 990 elderly Long Term Care residents was surveyed by a group of four nurses using a protocol of demographic, self-reported, staff-reported, and test data. Cognitive Impairment was quantified using the Mental Status Questionnaire (MSQ). The results indicated that 21% of residents demonstrated some form of problem behaviour on a daily basis. The problem behaviours included disorientation (15%), aggression (12%), wandering (7%),

noisiness(11%) and "other" (14%). A high MSQ score indicated absence of cognitive impairment and a low MSQ score indicated a severe level of cognitive impairment. The problem behaviours of disorientation (87%), aggression (84%), and wandering (88%) were associated with low MSQ scores but 4.8% of residents with high MSQ scores exhibited verbal aggression and manipulative behaviour. Residents who were not cognitively impaired but exhibited "problem" behaviours were identified as residents who were dissatisfied with placement or had been opposed to placement in the first place (Rockwood et al, 1989). A small number of residents were again reported to be responsible for the majority of problem behaviours, of which aggression is only one such behaviour. Sadly, this group of researchers concludes that LTC facilities must expect to accommodate these residents, offering nothing in the way of suggestions for further study or management strategies (Rockwood et al, 1989).

An investigation of the relationship between personal distance and manifestations of agitation in nursing home residents included over 1,000 observations of 24 residents in a three month period (Marx, Werner & Cohen-Mansfield, 1989). The Cohen-Mansfield Agitation Instrument and the Brief Cognitive Rating Scale were used to select participants who were highly agitated and cognitively

impaired. The Agitation Behaviour Mapping Instrument systematically observed and recorded agitated behaviours as they occur in the "natural" environment. The physical distance from the closest person in the environment was recorded along with direct observations of the resident.

Aggressive behaviours were specifically targeted in this study due to disruptive and painful consequences, along with behaviours found in previous research to occur most frequently among agitated elderly residents of nursing homes (strange movements, strange noises, pacing). Different agitated behaviours were differentially related to touch. More aggressive behaviour was manifested in response to touch than any other interpersonal distance, along with requests for attention, and strange noises (Marx et al, 1989). While touch was an inexpensive intervention for certain agitated behaviour, the findings of this study led to the recommendation that personal space should be extended for those residents who tended to display aggressive behaviour (Marx et al, 1989).

The three syndromes of aggression reported in 1986 by Cohen-Mansfield were reported again in 1989 in a study of nursing home residents (Cohen-Mansfield, Marx & Rosenthal, 1989). A larger sample of 408 residents was used in this second study and the Cohen-Mansfield Agitation Inventory (CMAI) was again used to collect data. The CMAI rates 29

behaviours on a seven point Likert scale: "1" means the behaviour is never displayed by a subject and "7" means the subject displays the behaviour several times per hour. The charge nurse, on each unit, for each shift, rated the subjects using the CMAI. The results indicated that 93% of the subjects displayed one or more agitated behaviours at least once per week (Cohen-Mansfield et al, 1989).

Factor analysis was used to identify three dimensions of agitation: aggressive behaviour (hitting, kicking, pushing, scratching, tearing things, cursing or verbal aggression grabbing, biting and spitting); physically non-aggressive behaviour; and verbally agitated behaviour. The behaviours were found to be stable across all shifts for particular individuals and to decrease from day to evening to night shift. The findings suggest that agitated behaviours are specific to individuals and represent robust syndromes (Cohen-Mansfield et al, 1989). The procedure of asking charge nurses to rate the behaviours and the frequency at which they occur for each subject, for each shift, raises a concern for yet another "indirect" method of quantifying this behaviour. Actual simultaneous recording of behaviour as it occurs, using the CMAI, might produce more accurate frequencies of individual behaviours.

Meddaugh (1990) raises the question of the differences and similarities between aggressive and non-aggressive

cognitively impaired, institutionalized elderly. Brehm's Reactance Theory (1966) was used as a framework for a study designed to answer this question (Meddaugh, 1990).

Aggressive and non-aggressive subjects were recruited from three different sites to participate. The subjects were directly observed for a total of fifteen (15) hours over a five (5) week period. A grounded theory approach was used to determine whether or not there were any changes or threats to freedom, as suggested by Reactance Theory, in the long term care setting. Multiple methods such as direct observation, retrospective chart review, incident report review, and semi-structured interviews with the family and resident were used to collect data. In addition, all changes in the social environment were documented (Meddaugh, 1990).

Differences were observed in the way in which these two groups of residents were approached. The non-aggressive residents were given more choices about their care whereas the aggressive residents were not given many choices. Episodes of aggressive behaviour were observed during the study that could be linked to the loss of the freedom of choice. Aggressive behaviour also occurred in relation to forced painful treatments about which the resident was given no options. The aggressive residents were not as verbal as the non-aggressive group but did retain some ability to speak.

Meddaugh's study (1990), is noteworthy because it was theory based and data were collected through direct observations of the behaviour by the researcher. The need for control and decision making in the lives of even cognitively impaired older persons was not relinquished with admission to a long term care facility and must be recognized when developing care plans (Meddaugh, 1990). Residents who had been very active prior to their need for placement were more likely to become aggressive in the nursing home (Meddaugh, 1990). This study described a social environment but made no reference to the physical or structural environment or the role it might play in aggressive behaviour.

In a second study, Meddaugh (1991) used Brehm's Reactance Theory to guide an ethnographic study to identify factors about the aggressive behaviour of elderly residents of nursing homes that contributed to staff abuse. A total of fourteen residents of three different nursing homes were directly observed twice a day for five weeks from 0730 to 1130 hours and 1630 to 1930 hours. These fourteen residents were responsible for seventy-one (71) aggressive acts in the previous six months including hitting (12), yelling (9), spitting (8), punching (7), grabbing (7), scratching (7), swearing (7), pinching (5), rude comments (5), kicking (3) and biting (1). The residents were not given opportunities

to express opinions, interact with others, release tension in acceptable ways, or make choices about the daily care regime. The residents were not allowed to choose where they sat for meals or what food was eaten. Aggressive residents were isolated from the daily activities of the facility (Meddaugh, 1991).

At least two incidents of aggression were directly observed during data collection that were not documented on the chart or on an incident report. The staff explained that this type of behaviour was "taken for granted " and "part of the job" (Meddaugh, 1991, p. 115).

Elderly nursing home residents have a very limited ability to freely make choices about the details of their daily care (Meddaugh, 1990, 1991). As suggested earlier in this review, Reactance Theory predicts that people will respond with aggressive behaviour if the freedom to choose behaviours which will maximize need satisfaction are limited (Brehm, 1966; Brehm & Brehm, 1981). This indepth study of aggressive behaviour displayed by the elderly residents of nursing homes would suggest support for Reactance Theory (Meddaugh, 1991).

Summary

While these studies represent progress in describing the aggressive behaviour of the elderly residents of long term care facilities, there continue to be methodological issues which must be addressed. Studies have included

residents of both long term care units and extended care units without considering the similarities or differences in these two groups. There is continued use of indirect measures of aggressive behaviour and retrospective chart reviews as a means of data collection. There is need for clarification and consistency in what is recorded.

The criteria that indicate aggression, assault, violence, agitation, and problem behaviour need to be delineated. The context within which this aggressive behaviour is displayed needs to be described, particularly in relation to the physical aspects of the environment such as variety, colour and lighting.

4. Aggressive Behaviour: Staff Behaviour as a Contextual Factor

Some descriptions of the social context of aggressive behaviour are now emerging in the literature. The role that the nursing staff play in establishing and consistently interpreting the social or therapeutic milieu (Morrison, 1989) was described along with the impact of care approaches emphasizing patient control and reasonable limits for behaviour (Morrison, 1990). The skill with which nurses establish care these approaches has been linked to fewer assaults of these nurses and a reduction in the frequency of aggressive behaviour (Beck, Baldwin, Modlin & Lewis, 1990,

Blair & New, 1991, Ryden, 1992, Feldt & Ryden, 1992, Kingdom, 1992).

Nursing staff are responsible for giving patients the information that they need to assume the roles expected of them while on the psychiatric unit (Morrison, 1989). A study to determine, from a nursing perspective, the causal factors contributing to psychiatric patient violence found that the therapeutic and social rules that patients were expected to adhere to were not consistently interpreted for the patients by the nurses (Morrison, 1989). The therapeutic rules were defined as "expectations that the nursing staff hold for the patient's participation in treatment" and the social rules were the "expectations that the nursing staff hold for the patient's participation in group living" (Morrison, 1989, p. 33). The inability of the patient to perform the expected behaviours resulted in violent behaviour. Morrison(1989) was concerned that recent research about violent behaviour did not identify the effect of environment or of interpersonal factors that influence patient behaviour. (Specific environmental factors that concerned Morrison were not identified in the report.)

The data were collected from four different psychiatric hospitals and included at least one psychogeriatric unit but the average age of subjects was only 39 years (Morrison, 1989). The length of hospital stay, previous violence

against others, and a history of substance abuse were three demographic factors which had a relationship with violence. Inadequate socialization of patients by nursing staff in relation to role expectations was positively related to role incompetence and violence in psychiatric inpatients. Morrison (1989), suggested that nursing care plans need to focus on consistent enforcement of social expectations in order to decrease negative behaviour such as violence.

Morrison (1990) conducted a qualitative study using participant observation to identify the characteristics of violent patients and the components of nursing care that are related to violent patient behaviour. Violence was defined as any verbal, non-verbal, or physical behaviour that was threatening (to self, others or property), or physical behaviour that actually did harm (to self, others or property).

Data were collected for a nine month period, on day and evening shifts, for about 8 hours each week. The observations took place on a number of different units including a psychogeriatric unit. The researcher was able to identify six categories of violent patients: the user; the outlaw; the rebel without a cause; the little big man; the child; and the vamp. Violent behaviour was used to maximize short term gains, such as time-out which would allow the patient to avoid unit activities. The violent

patient had a strong need to control others in their environment and used negative reinforcement to accomplish this control. The violent patient would, for example, become argumentative and hostile if the nurse that the patient had approached refused to stop what he/she was doing and talk with the patient, negatively reinforcing the nurse's behaviour.

There were many positive rewards for violent behaviour and negative consequences were not consistently applied by all nursing staff or contingent on the violent behaviour. Violent patients were very consistent in their choice of target although the choice of target was dependent on the category of violent patient: the user targeted a vulnerable other; the outlaw and vamp targeted staff; the child was self-destructive; and the little big man targeted male staff.

Morrison (1990) has suggested that all violent patients would benefit from nursing care plans that emphasize high patient and low staff control building in reasonable limit setting. Further research, including observation of the same patient in another setting to identify the impact of physical environment of violent behaviour and careful examination of the nurse-patient relationship, is needed to understand better the impact of these factors on aggressive behaviour (Morrison, 1990).

In another study, formal caregivers were interviewed in an attempt to identify the characteristics of aggressive behaviour and how caregivers responded to aggressive cognitively impaired nursing home residents (Beck, Baldwin, Modlin, & Lewis, 1990). A combination of nursing assistants and nurses participated in the study. These caregivers reported high levels of verbal aggression (95%), and moderate levels of physical aggression (68%). Aggressive behaviour occurred throughout the day (37%) mainly during direct care activities such as changing, dressing, feeding, transferring, and giving medication (Beck et al, 1990).

New staff were thought to be the target of aggressive behaviour (25%) which may reflect a lack of communication skills or the inability of new staff to maintain effectively stability in the environment (Beck et al, 1990). Staff most often attempted to comfort the patient by talking when aggressive behaviour erupted (37%).

The researchers approached each of the caregivers and asked them, in an interview, to describe aggressive behaviour. While descriptive data such as this is necessary to formulate new research questions, the concern with this study is that the interview was the only source of data. Qualitative methodology uses triangulation as a method for establishing reliability and validity, to provide a convergence on truth (Polit & Hungler, 1987). Additional approaches to data collection would have strengthened the

confidence in these findings. A specific definition of what was meant by aggressive behaviour might have elicited data that could have corroborated or disputed the findings of other studies.

Assaultive behaviour, as suggested by Blair and New (1991), is precipitated by a combination of personal risk factors, situational factors, and treatment characteristics which then interact with the pathology of the patient. A combination of history of assault, diagnosis, and legal status on admission has facilitated identification of risk for assaultive behaviour in particular patients. The individual approaches used by nursing staff, and the amount of direct contact they have with patients have been the most helpful in designing care to reduce assaultive behaviour (Blair & New, 1991).

Interpersonal conflict and a desire to be left alone is offered by many assaultive patients as a rationale for their behaviour. Assaultive patients believe that their behaviour was provoked by the victim of the behaviour (Blair & New, 1991). Failure of nursing staff to set limits effectively for behaviour of patients escalated into assaults (Blair & New, 1991). Staff with training and experience in limit setting and control techniques had much lower assault rate than did staff who did not have this training.

Treatment that is perceived by the patient to be coercive, controlling, or threatening is thought to reduce behaviour options of patients to desperate acts of violence and assault (Blair & New, 1991). The review concludes by suggesting that staff may provoke assaults by imposing severe negative consequences for assaultive behaviour out of a need for power and control (Blair & New, 1991).

The interpretation of the literature provided by Blair and New (1991) is consistent with the conclusions being drawn in this current review. The suggestion that the solutions lie only in the training of staff, however, neglects the impact that structure and built environments have on behaviour. There may also be solutions in creating supportive, caring environments for both patients and staff.

Most aggressive behaviour in cognitively impaired elderly occurs in response to some environmental stimulus, such as touch or invasion of personal space (Ryden, 1992). Modification of interpersonal approaches and environmental stimuli has been suggested as a means to reduce aggressive behaviour in light of the knowledge that persons with dementia have a limited capacity to learn (Ryden, 1992). The need for identification of specific target behaviours and antecedent events is essential to development of individualized approaches to the aggressive resident. Five

primary goals for the care of aggressive cognitively impaired residents were outlined by Ryden (1992,p. 88):

1. For the client to feel safe.
2. For the client to feel physically comfortable.
3. For the client to experience a sense of control.
4. For the client to experience optimal stress.
5. For the client to experience pleasure.

Environmental Press was defined, by Lawton and Nahemow (1973), as forces in the environment that together with an individual need evoke a response. Stability, routine, and predictability reduce environmental press for cognitively impaired elderly who were no longer able to adapt to change (Ryden, 1992). Nurses need to design care plans for the elderly aggressive individual that encompasses these goals in order to reduce such behaviour.

Recognizing that 80-90% of direct care of residents of nursing homes is provided by nursing assistants, an educational program was developed and tested to determine if it was an effective strategy to reduce the prevalence and severity of behaviour problems, including aggression (Feldt & Ryden, 1992). The education strategy included role modelling and problem solving by a gerontological clinical nurse specialist. The components taught in the program included cognitive impairment, understanding precipitants of aggressive behaviour, communication techniques, identifying basic goals for aggressive residents, strategies to prevent aggressive behaviour, preventing escalation of aggressive

behaviour, managing personal feelings, and individualizing the care plan. Measures of pre-test and post-test scores in three areas resulted in significant findings for only one measure: the Experience of Caregiving. The nursing assistants were more positive about caring for aggressive residents and less frustrated (Feldt & Ryden, 1992). What remains unclear from this study is whether it was the educational program alone which resulted in the attitude change, the role modelling provided by the clinical nurse specialist, or a combination of the two strategies.

A Canadian nursing home in Ontario developed a training program to ensure that the care climate was both supportive and caring (Kingdom, 1992). The program was developed in response to frustration and anger expressed by staff who were attempting to manage the care of aggressive nursing home residents. A task force funded by the Ontario Ministry of Skills Development and the Municipal Health and Safety Program created the components of the training package. The impact of the program was not tested for measurable outcomes but it is perceived to have had a positive impact on the behaviour of the nursing staff (Kingdom, 1992). Nursing is a research based practice which must be strengthened by scientifically measuring and contrasting outcomes of innovations in practice to the status quo.

Summary

These studies draw attention to the role of nurses in establishing and maintaining a therapeutic and supportive social environment. As the consistency with which the nurses interpreted the therapeutic and social rules for psychiatric inpatients increased, the amount of violence decreased (Morrison, 1989). Care plans emphasizing patient control rather than staff control, within reasonable limits, resulted in reduced incidents of violence on one psychiatric unit (Morrison, 1990).

Staff who were trained and experienced in limit setting and control techniques were involved in fewer assaults (Blair & New, 1991). Nursing approaches designed to reduce environmental stress: stability, routine and predictability for cognitively impaired elderly resulted in fewer aggressive episodes for those residents (Ryden, 1992). Finally, a positive attitude of caregivers towards the aggressive elderly residents led to a reduction in the frequency of aggression in two nursing homes (Feldt & Ryden, 1992, Kingdom, 1992). Nursing behaviour as a contextual factor in aggressive behaviour in the elderly has been reinforced with this study.

The use of different terms such as violence, assault, and aggression makes comparisons of these findings

difficult. The concepts of violence, assault and aggression are not synonymous. The physical aspects of the environment were not included in these studies limiting further the utility these studies have in answering the research question at hand. In addition, strategies such as education and modelling are suggested as a solution for nurses to improve their ability to support aggressive elderly residents, which may at best be premature.

5. Aggressive Behaviour and Cognitive Functioning

The level of cognitive function has been studied in relation to aggressive behaviour of the elderly, as a possible contextual factor. Cognitive functioning was studied in relation to ability to interpret the environment (Roberts & Algase, 1988), the severity of pathology (Ryden, 1988, Chrisman, Tabar, Whall, & Boehm, 1989, Chrisman, Tabar, Whall & Booth, 1991), decisions to place aggressive elderly in nursing homes (Hamel et al, 1989), and in relation to the meaning given to this behaviour by formal caregivers (Beck, Baldwin, Modlin, & Lewis, 1990, Bolger, Dougherty, Bray, Confroy, Dodson, Jones & Vesey, 1988).

Alzheimer's Disease impairs the ability of the individual to access information and process it within the

present and past context (Roberts & Algase, 1988).

Legibility of the environment refers to the degree that the environment promotes predictability and direction finding (Roberts & Algase, 1988). Persons with Alzheimer's Disease may respond to the environment in a maladaptive way because it is the only response they can make based on the information they have available to them (Roberts & Algase, 1988). The amount of information presented by the nurse may be adequate for a more competent individual, but the cognitively impaired individual needs more precise direction and guidance from the environment. Access to the environment and to internal "personal" information is essential for behaviour outcomes. Cognitive impairment disrupts both the ability to interpret environmental cues and the ability to integrate this information with internal cues (Roberts & Algase, 1988). Catastrophic reactions, such as emotional outbursts and aggressive behaviour, are symptoms of environmental demands which exceed the individual's capacity to adapt (Roberts & Algase, 1988). The model of "Person-Environment Interaction" suggests that the interaction between the environment and key functional abilities (sensory function, mobility, and memory) of the person with Alzheimer's Disease will produce behaviour (Roberts & Algase, 1988). The model was intended to guide assessment and planning of appropriate environments specifically for individuals with Alzheimer's Disease.

A positive relationship between the severity of cognitive impairment and the extent of physical and verbal aggression has suggested that pathological changes in the brain operate as an influential factor in the occurrence of aggressive behaviour (Ryden, 1988). Ryden (1988), examined the aggressive behaviour of individuals with dementia living in the community and found that 65% displayed aggressive behaviour. There were 183 subjects in the study of whom 119 displayed one, two or all three types of aggressive behaviour (Ryden, 1988). The aggressive behaviour was expressed in three ways: verbally (49.7%), physically (46.4%), and sexually (17.5%). There were 84.7% of the subjects described as moderately to severely cognitively impaired. The mean age of the subjects was 71.13 years (Ryden, 1988).

Studies of aggressive or assaultive behaviour in psychiatric settings have suggested that a history of assault is predictive of further assaultive behaviour (Blomhoff et al, 1990; Boettcher, 1983; Convit et al, 1990; Lanza et al, 1988; Rix & Seymour, 1988). Ryden (1988) found prior aggressive behaviour had occurred in 40.4% of subjects before the onset of the dementing illness, suggesting that innate internal drives for aggression, or long standing learned behaviour patterns continue to operate in the individual with cognitive impairment.

A state psychogeriatric facility examined the forms of aggressive behaviour displayed by the elderly residents of the facility and the effect such behaviour had on the job satisfaction for the nursing staff (Bolger, Dougherty, Bray, Confroy, Dodson, Jones & Vesey, 1988). Aggressive behaviour was defined as physical aggression directed at another patient or staff member, verbal aggression directed at another patient or staff member, or general disruptive behaviour. A total of twenty eight (28) staff: 16 mental health workers, 7 Licensed Practical Nurses, and 5 Registered Nurses participated in the study. Using a seven point Likert type scale the nursing staff identified the frequency of exposure to the three types of aggressive behaviour in the past month. ("1" meant never exposed in the past month, "7" meant exposed several times per day.) The "Index of Work Satisfaction Questionnaire" was used to measure job satisfaction.

While physical aggression was the most frequently occurring form of aggression, verbal aggression was more strongly related to job satisfaction. Dementia was the most frequent diagnosis for aggressive residents (21%), followed by psychosis (18%), and alcoholism (14%). Aggressive behaviour occurred throughout the twenty-four hour period but half (50%) occurred in the morning. Job dissatisfaction increased with exposure to verbal aggression, physical aggression, and to general disruptive behaviour indicating a

need for support for nursing staff to increase their ability to cope (Bolger et al, 1988). Unfortunately, the data were collected from a self report of the nursing staff who were asked to recall behaviour over the past month.

Retrospective data collection has been questioned in terms of its ability to represent accurately the details of aggressive behaviour.

Agitation in the cognitively impaired elderly often escalates to violent behaviour resulting in danger to self and/or others and leads to "burnout" of nurse caregivers (Chrisman, Tabar, Whall & Boehm, 1989, Chrisman, Tabar, Whall & Booth, 1991). Recognizing that several tools had been developed to measure "disruptive behaviour", Chrisman et al (1989) designed this study to assess the non-participant observation process and inter-rater reliability of these tools. The Cohen-Mansfield Agitation Inventory (CMAI) was modified to become a direct observation tool and used along with the Ward Behaviour Inventory (WBI), and the Confusion Inventory (CI) to measure disruptive behaviour (Chrisman et al, 1989, Chrisman et al 1991).

The subjects of the study were all elderly nursing home residents with a diagnosis of irreversible dementia and who scored less than 20 on the Mini-Mental State Examination (MMSE). Direct observations of the subjects were made for two hour periods at two different times of day, by two

different nurse researchers, for a total of three observations of each subject. The WBI, CMAI, and CI were scored independently for each subject at each observation.

The results indicate convergent validity between the CMAI, the WBI, and the CI with a stronger correlation between the CMAI and the WBI (Chrisman et al, 1989, Chrisman et al, 1991). The conclusion drawn supported the use of the CMAI as a valid tool for measurement of agitated behaviours. One of the inclusion criteria for this study was cognitive impairment, along with a history of demonstrated agitated behaviour. Although the report tells the reader how many of the behaviours listed on each tool were exhibited during the study, the reader was not told whether every subject demonstrated agitated behaviour. Inclusion of these data in the report would facilitate understanding of the relationship of cognitive impairment to agitation.

The introduction of yet another phrase, disruptive behaviour, leads to increasing frustration in attempts to compare various research findings. Chrisman et al (1989, Chrisman et al, 1991) had stated that Nightingale's view that a negative environment can lead to ill health and patient stress was an assumption of this research but they have failed to include measures of the physical and social environment in their work.

Beck et al (1990) approached the staff of a nursing home and asked them to describe the aggressive behaviour of cognitively impaired elderly. These caregivers reported both physical (68%) and verbal (95%) aggression which occurred most often during morning care. The study specifically examined cognitively impaired elderly and no information is presented regarding aggressive behaviour of other residents. The caregiver response to this behaviour has been described earlier in this review.

The frequency, nature and context of patient aggression as well as caregivers reaction to the aggression have been implicated in the decision to seek formal placement of elderly persons with dementia (Hamel et al, 1989). The Ryden Aggression Scale (RAS) was used along with the Hierarchic Dementia Scale (HDS), the General Health Questionnaire (GHQ), the Burden Interview, the Social Interaction Scale, and the NEO Personality Inventory. Verbal Aggression occurred most frequently (51%), followed by physical aggression (34.1%). Sexual aggression was rare (7.2%). The mean score of 1.72 is reported for any of the behaviours identified on the RAS as occurring one to three times per month, and 1.45 for behaviours occurring one or more times daily.

A history of aggressive behaviour prior to the onset of dementia predicted the aggressive behaviour with dementia

(Hamel et al, 1989). The level of cognitive impairment as measured by the HDS had not predicted aggression, but the confused troublesome patient was more likely to be aggressive and to be judged as impaired by caregivers (Hamel et al, 1989). Although only low levels of aggressive behaviour were detected in this sample of cognitively impaired elderly, there was suggestion of a connection between cognitive functioning and aggressive behaviour, just as a history of aggressive behaviour and violence in the family of origin were linked with violence and assault as cited previously in this review.

The nature, frequency of occurrence, and context of aggressive behaviour in cognitively impaired residents of a nursing home was explored using concurrent recording of observed behaviour (Ryden, Bossenmaier, & McLachlan, 1991). The Ryden Aggression Scale was modified to allow for its use as a concurrent measure of aggressive behaviour (Ryden et al, 1991). The aggressive behaviour observed in this study was classified as verbal, physical, or sexual with 86.3% of 124 subjects displaying at least one form of aggressive behaviour during a seven day direct observation period. The amounts of aggressive behaviour observed were reported as 50% physical, 47.6% verbal, and only 4% sexual.

A majority (81.5%) of the subjects had a neuropsychiatric diagnosis such as Alzheimer's Disease, Chronic

Brain Syndrome, or Cerebral Insufficiency. The lack of relationship between Aggression Scores and scores on the Short Portable Mental Status Questionnaire (SPMSQ) was thought to be due to the fact that 79% of the subjects had a score of less than 2 on the SPMSQ, indicating a high degree of cognitive impairment. The day shift had the highest incidence of all three types of aggressive behaviour, with most of the aggressive behaviour occurring in resident rooms. The behaviour was most often in response to touch or the invasion of personal space during caregiving (72.3%)(Ryden et al, 1991). The study suggested that the amount of aggressive or agitated behaviour may be related to the degree of cognitive impairment in a curvilinear relationship (Cohen-Mansfield, 1988; Ryden, 1988; Ryden et al, 1991). This finding likely reflects the reality that as cognitive impairment increases, physical abilities are diminished.

Designed to describe "the most difficult to manage" disruptive behaviours in a nursing home, researchers found that of 36% of the residents engaged in disruptive or aggressive behaviours, 85% of these same residents were cognitively impaired (Whall, Gillis, Yankou, Booth & Beel-Bates, 1992). Hitting and slapping were the most common behaviours cited by the nursing staff (71%), followed by verbal aggression (60%). The Cohen-Mansfield Agitation

Inventory (CMAI) was the tool used to gather data in this study (Whall et al, 1992). The nursing staff reported their most common responses to aggressive or disruptive behaviour were talking with the resident, using chemical or physical restraints, time out, and touch (Whall et al, 1992).

Summary

Cognitive impairment disrupts both the ability to interpret environmental cues and the ability to integrate information from the environment with internal cues (Roberts & Algase, 1988). Aggressive behaviour is an example of a catastrophic reaction of an individual to excessive environmental demands, the potential for which increases with cognitive impairment (Roberts & Algase, 1988). Studies have shown that cognitive impairment has a curvilinear relationship to the frequency of aggressive behaviour (Hamel et al, 1988, Ryden, 1988, Ryden et al, 1991, Whall et al, 1992).

A history of expressed aggressive behaviour prior to a dementing illness predicted aggressive behaviour in the demented state in two studies, supporting similar findings for psychiatric patients (Blomhoff, 1990, Hamel et al, 1988, Ryden, 1988). Long standing behaviour patterns continue to operate in cognitively impaired individuals (Ryden, 1988).

The work by Chrisman and others (1989, 1991) demonstrated agitation in cognitively impaired elderly, but what is not clear from this work is whether or not

cognitively intact elderly are also agitated, or whether or not there are cognitively impaired individuals who do not display agitated behaviour.

Aggressive behaviour occurred most often during direct care and in response to touch supporting previous findings (Beck et al, 1990, Marx et al, 1989, Ryden et al, 1991).

Once again multiple terms have been used interchangeably: aggressive behaviour, disruptive behaviours, and agitation although there emerges the idea that agitation is a broader more global description of behaviour with aggression being one of a number of extreme behaviours in this category (Chrisman et al, 1989, Chrisman et al, 1991, Hamel et al, 1988, Ryden, 1988, Ryden et al, 1991).

6. Aggressive Behaviour and The Influence of the Physical Environment

The literature reviewed to this point has largely ignored the impact of the physical environment on human behaviour generally, or on aggressive behaviour specifically. A careful review of literature relating to therapeutic environments (Proshansky, Ittelson & Rivlin, 1970), along with relationships between aspects of the physical environment, such as crowding, ambient temperature, colour, noise, and human behaviour (Desor, 1972, Baron,

1972, Birren, 1961, Mahnke & Mahnke, 1987, Marshall, Mrazek & Roshko, 1992, Nightingale, 1869, Schauss, 1979, Standing & Stace, 1980) will demonstrate a need for careful consideration of the environment as a contextual factor in aggressive behaviour. The work of Lawton (1980, 1989), Kerr (1982), Kiernat (1983), Boettcher (1985), Kayser-Jones (1989, 1991), McCracken and Fitzwater (1989), Cluff (1990), and Kolanowski (1992) examine the specific response of the elderly to the physical environment. Although specific conclusions in relation to aggressive behaviour have not been provided by this work, the notion of complexity and context have been reinforced as important variables which must be considered.

In order to design psychiatric facilities with a therapeutic milieu and a positive influence on social interactions, a conceptually adequate definition of physical environment needed to be developed (Proshansky, Ittelson & Rivlin, 1970). This work identified several basic assumptions about the influence of the physical environment on behaviour. One of these assumptions is that when changes are made in the physical, social or administrative structures that define a setting there will be a corresponding change in the characteristic behaviour patterns in that setting (Proshansky et al, 1970). A careful examination of the environments in which aggressive

behaviour occurs should identify which of the environmental components is contributing to the behaviour.

The concept of crowding was explored with a group of 70 subjects by asking them to place models of humans into scaled models of rooms until the room was considered crowded (Desor, 1972). The study found that crowding is much more than merely a matter of space. Crowding involved perceptions of receiving excess stimulation from social sources as well as large numbers of people in a room. The use of design features such as sound absorbing materials for walls, ceilings, and partitions; as well as minimizing the numbers of doors, windows, and mirrors that provide views of peopled spaces; maximizing the disparity between the linear dimensions of space; low lighting levels; and high non-social noise levels have all been found to reduce perceptions of crowding in a room (Desor, 1972).

Increasing the amount of space available by increasing the size of a room or by reducing the numbers of people in a room were not always realistic solutions to the problem of perceived crowding. The subjects in this study provided less space per person when partitions were present, when there were fewer doors, and when the room was rectangular. They also placed more "people" in larger rooms than smaller rooms. Finally the activity in the room: a cocktail party, waiting in an airport, sitting and talking, and sitting and

reading incrementally reduced the number of "people" placed in the room before it was considered crowded (Desor, 1972).

The size of the room and the anticipated activity in the room could be expected to alter behaviour in some way in the institution (Desor, 1972). Residents of institutions are often placed in lounge spaces with little or no explanation of the expected activity. If the expectations are unclear to the resident then the perception of crowding and its related anxiety may be increased. An increase in anxiety could be escalated to an outburst of aggression if the situational factors were conducive to such an outburst.

A rather complex process of arousing anger and administering shocks to a confederate of the investigator, in a laboratory setting, demonstrated that as the ambient temperature of the room rose the number and intensity of shocks delivered by the subject decreased (Baron, 1972). The very controlled nature of the study and the more "structured" form of aggression being presented bears very little resemblance to the biting, kicking, and pinching described earlier in this review. The expectation that high temperature creates "short" tempers was not borne out in this study, but further study under more normal circumstances would be needed before a conclusion could be drawn. This was the only study found which attempted to link the physical environment with specifically aggressive

behaviour, but, unfortunately, it does little to enhance our understanding of the relationship.

There is a specific shade of pink thought to have a moderating effect on individuals having feelings of anger and agitation (Schauss, 1979). When a two foot by three foot piece of pink construction paper was held in front of the eyes of 38 subjects, they lost up to 23% of their muscle strength. Based on these findings, the U.S. Naval Corrections Centre in Seattle, Washington painted a holding cell entirely this shade of pink except for the floor. Following the change in colour, there were no incidents of erratic or hostile behaviour. Two other sites, the Kuiper Youth Centre for juvenile delinquents in San Bernardino and the San Clara County Jail in San Jose, California, have reported similar dramatic effects. The colour is thought to be inducing some sort of endocrine response which cannot be controlled with either conscious or unconscious effort (Schauss, 1979). The drama of such results lends a skeptical view of the findings but further research on this particular colour could not be located.

Responses to a variety of colours have been documented in the literature for more than one hundred years (Birren, 1961, Mahnke & Mahnke, 1987, Nightingale, 1869, Sharpe, 1974). Colours of the spectrum are associated with two

moods, exciting for warm colours and calming for cool colours. While the response effects of colour are always temporary, each colour: red, orange, yellow, green, blue, purple, white and black creates both positive and negative responses in individuals (Birren, 1961). The colour hue, chroma, value, and proportion may also affect our positive and negative responses to certain colours (Marshall et al, 1992). Hue refers to the specific colour such as red, blue or green. Chroma refers to the degree of vividness in a colour. Value refers to the relative lightness or darkness of a colour. Birren (1978) suggested that people require varying, cycling stimuli to remain sensitive and alert to their environments. Research has demonstrated both visual and non-visual responses to colour and light (Mahnke & Mahnke, 1987).

Disturbing colours, misinterpreted, may give rise to unexpected and undesirable behaviour (McKenzie, unpublished). It is important to create environments for the elderly which enhance and promote accurate interpretation. Studies of colour and the elderly have been limited to examinations of preferences and have not included descriptions of behaviour in relation to colour (Marshall, Mrazek & Roshko, 1992, Sharpe, 1974).

Monotones of any colour make it difficult for the elderly to negotiate corridors and doorways (Hayter, 1983). White reflects light, dark blends into shadows, and both

make ambulation difficult (Hayter, 1983). Varieties of colours, limited use of patterns, and avoidance of colours known to be disturbing (such as red and purple) should enhance the functioning of the older adult (Birren, 1961, Mahnke & Mahnke, 1987, Marshall et al, 1992, Nightingale, 1869).

Standing and Stace (1980) found that situational anxiety was significantly elevated when experimental subjects were exposed to very noisy levels of ambient white noise. In this study, under laboratory conditions, 45 subjects in small groups of four to six were exposed to quiet, noisy, and very noisy conditions respectively. The noise was generated in an adjacent laboratory and the subjects were unable to identify the source of the sound. Each subject was asked to complete a questionnaire during the exposure to the noise and then two measures of anxiety were completed following cessation of the noise. The study was a replication of a previous study with minor modifications. The duration of the exposure to the noise was reduced 30 minutes from the previous study (Standing & Stace, 1980). Roberts and Algase (1988) and Lawton (1980) have suggested that the elderly need more precise information in order to interpret their environment. Unidentifiable noise, assuming they could hear it, could be expected to create anxiety in the elderly.

"Environmental press" refers to the forces in the environment that together with an individual need evoke a response; some environments make greater behavioral demands than others (Lawton, 1980, Lawton & Nahemow, 1973). The environmental docility hypothesis states the less competent the individual, the greater the impact of environmental factors on that individual (Lawton, 1980, Lawton & Nahemow, 1973). Behavioural outcomes that are the result of a given level of competence in a given level of environmental press can be placed on a continuum from positive to negative reflecting the individual's ability to adapt to his environment.

The elderly are more subject to reductions in competence than the younger adult, where competence is defined in relation to biological health, sensorimotor functioning, cognitive skill, and ego strength (Lawton, 1980, Lawton & Nahemow, 1973). While this statement may not apply to all older adults, the residents of nursing homes have often experienced losses in all of these areas.

Strong environmental press on incompetent individuals, based on the ecological model, will result in maladaptive behaviour and a negative affect (Lawton, 1980, Lawton & Nahemow, 1973). Such maladaptive behaviour is also possible for strong environmental press on competent individuals, where such press exceeds their ability to adapt. The model is helpful in explaining the aggressive behaviour displayed

by both cognitively impaired and cognitively intact individuals.

Gump(cited in Kerr, 1982) found that behaviour was linked to setting in a 20 year study of children where the behaviour of the children varied less within a setting than between settings. Behaviour was similar within environmental settings and individual personalities were not the major determinants of human behaviour. Similar themes were raised by Kerr (1982) throughout her review of theory and research relating to space use in hospitals. Studies by several researchers have demonstrated behaviour, and changes in behaviour, in response to the environment in which it occurs. Examples included school settings with children, psychiatric hospitals, and a geriatric hospital ward. The conclusion drawn by Kerr (1982) was that characteristic behaviour patterns in particular environments exist and can be identified. The suggestion was that aggressive behaviour is expected in specific environments and as a result the behaviour would occur no matter which patients, residents, or staff were present. This is a rather extreme view of behaviour that is entrenched in a purely environmental perspective, and ignores the rich variety of behaviour that individuals bring to a setting.

Environmental effects play such a central role in the behaviour of elderly persons that environment should be considered a "Hidden Modality" in rehabilitation programs (Kiernat, 1983). Using Lawton and Nehemow's (1974) ecological model of environmental press, Kiernat (1983) suggested that the goal of a rehabilitation program should be to assist individuals in achieving a person-environment fit that will promote effective behaviours (Kiernat, 1983). Factors that must be considered in creating environmental congruence are personal space, territorial needs, psychosocial environment, and prosthetics such as redundant cueing and increased lighting (Kiernat, 1983). The environment can be shaped and graded so that demands match competencies and compensate for the elderly person's declining abilities resulting in increased independence for the individual (Kiernat, 1983).

The ability to leave a setting that does not provide human need satisfaction is not often extended to institutionalized elderly (Boettcher, 1985). Quality of life is determined by the ability of the environment to provide satisfiers for human needs. Using constant comparative methodology, a study was designed to determine the core environmental variable that influences human need satisfaction for the elderly residents of an institution. A theory of boundary marking emerged which is a social

ecological process that promotes or restricts access to environmental resources which function as need satisfiers (Boettcher, 1985). Boundary marking, thought to be the core environmental variable that influenced human need satisfaction, was made up of three phases: delineating space, institutionalizing time, and controlling supplies. Planned boundary marking based on individually assessed needs would create and maintain a therapeutic environment that is sensitive to the satisfaction of survival, belonging and freedom needs of institutionalized elderly (Boettcher, 1985).

"The disparity between what is known about the importance of the environment in promoting well being in health care institutions and what is found in practice is enormous " (Kayser-Jones, 1989, p. 126). The quality of care and resident satisfaction was studied in a 1200 bed facility, built in 1926, using quantitative and qualitative methodologies (Kayser-Jones, 1989). A surprising 88% of elderly residents stated a preference for open wards over any other type of accommodation. The open ward design prevented loneliness and isolation; prevented placement with an incompatible room mate; provided a source of sensory and psychosocial stimulation; and was like a small community with a unique social organization.

The residents cited noise and sleep disturbances; and forced integration of cognitively impaired elderly as the disadvantages to the open ward design. Kayser-Jones (1989), concluded that there are many environmental factors that can promote well-being but none is more important than the characteristics of the nursing staff. Nurses should be involved in designing facilities and writing policies that will increase the nurse-patient contact (Kayser-Jones, 1989).

The greater supervision and interaction with staff, a less stressful environment, and the social dynamics of the closed unit were thought to be largely responsible the improved functioning of residents of a closed Alzheimer's unit (McCracken & Fitzwater, 1989). The Dementia Behaviour Scale was used to evaluate the level of cognitive impairment of residents prior to admission to this unit (McCracken & Fitzwater, 1989). The scale assigns a score of zero to a person with no behavioural deficits and a score of 48 to a totally impaired person. Patients with a score between 20 and 40 were placed on the closed unit and reassessed every month by the clinical nurse specialist. After one year, eight of eleven residents had improved in function. The tool was also helpful to nursing staff by detecting sudden declines in function that were related to new pathology or medication and prevented falls (McCracken & Fitzwater,

1989). The specific design of the closed unit is not provided in the report but clearly the physical and social aspects of the environment were fundamental to improved patient outcomes.

In contrast, Lawton (1989) states that an ideal therapeutic environment does not exist. The fixed environment can prevent some behaviours and facilitate others. People perceive the environment, organize it cognitively, make choices about the options that are available to them, change the environment to suit themselves, and make rules about its use which affect other people. This makes the notion that environment causes certain behaviour, a rare and unlikely event (Lawton, 1989). In addition to making a number of design recommendations, Lawton (1989) has recommended the establishment of a therapeutic environment committee to motivate staff and encourage them to share their ideas about appropriate environmental change. There is a key role, suggested Lawton, for direct care staff and in-home workers to facilitate the creative use of environments for cognitively impaired elderly.

Designers have been challenged in recent years to generate "compensatory and supportive" environmental solutions for progressively reduced competence (Cluff,

1990). A great danger is the tendency to design for the least competent, leading to the standard hospital ward design. Through trial and error several concepts have emerged that have implications for designers:

1. environments must allow for change in the resident and change in programming, operations, policy, and staffing;
2. choice in the environment is necessary to accommodate different personal needs, programs and to provide opportunities;
3. reinforcement and support of resident competencies should come from the environment and include orientation aids;
4. provision for privacy and social interaction in balanced amounts;
5. security and access to a diversity of locations and destinations within the environment;
6. human scale and home like quality to spaces using normal patterns and textures;
7. appropriate building systems such as nurse call, emergency call, fire alarms, signage, and clocks. The use of redundant cueing sends cognitively impaired residents more than one message which may help them interpret such messages (Cluff, 1990).

Although aggressive behaviour was not specifically identified, Cluff (1990) stated that one of the easiest design tools which can be utilized to support reduced visual

or cognitive function is the use and application of colour. The process used to select colour should include consideration of the space as well as the quality and quantity of natural or artificial light. The physical and spatial recommendations can be used to evaluate existing settings and design new facilities which will optimize the remaining functional abilities of cognitively impaired elderly (Cluff, 1990).

Kayser-Jones (1991) suggested that there are four major features of the environment: the physical aspects (design, colour, lighting and space); the organizational aspects (policy, staffing and financing); the personal (family, friends) and suprapersonal environment (the race and mean age in a neighbourhood); and the social-psychological milieu (norms, values and beliefs of the caregivers). The four components are in constant interaction with and influence one another (Kayser-Jones, 1991). Based on a qualitative, comparative study made between a small Scottish home for the aged and a large for profit home in the United States, Kayser-Jones (1991) concludes that social-psychological environmental factors had the greatest influence on the quality of care in each setting.

In a literature review of environmental lighting, Kolanowski (1992) concluded that elderly residents who spend

a great deal of time under artificial lights may need repatterning of their light environment. The literature suggests bright, non-glaring, indirect sources of light; broad spectrum lighting that simulates natural sunlight; some exposure to ultraviolet illumination; and recognition that there are individual differences in light-dark cycles. These must all be considered in caring for the elderly. The essential next step was to explore the specific effects different light sources have on the well-being of the elderly (Kolanowski, 1992).

Summary

There is a large body of literature describing the relationship of environment to human behaviour as well as the relationships of specific aspects of the physical environment to behaviour (Baron, 1972, Birren, 1961, Boettcher, 1985, Cluff, 1990, Desor, 1972, Hayter, 1983, Kayser-Jones, 1989, 1990, Kerr, 1982, Kiernat, 1983, Kolanowski, 1992, Lawton, 1980, 1989, Lawton & Nahemow, 1973, McCracken & Fitzwater, 1989, Proshansky et al, 1970, Schauss, 1979, Standing & Stace, 1980). The first theme that emerged was that of characteristic behaviour patterns which are related to a particular setting (Kerr, 1982, Proshansky et al, 1970). The relationship of environmental press and competency as a factor in behaviour which can be shaped and molded to create a supportive person-environment

fit emerged as a second theme (Boettcher, 1985, Cluff, 1990, Kiernat, 1983, Lawton, 1980, 1989, Lawton & Nahemow, 1973).

A third theme that emerged was the importance of the characteristics of the nursing staff and the importance of the social-psychological environment as a determinant of behaviour (Boettcher, 1985, Kayser-Jones, 1989, 1991, McCracken & Fitzwater, 1989). Finally, while specific attributes of the physical environment such as crowding (Desor, 1972), ambient temperature (Baron, 1972), white noise (Standing & Stace, 1980), colour (Birren, 1961, Mahnke & Mahnke, 1987, Nightingale, 1869, Sharpe, 1974), and lighting (Kolanowski, 1992) have been studied their specific relationships to behaviour require closer scrutiny.

Chapter Summary

This literature review has included theories of aggressive behaviour as a learned response; description and prediction of human aggressive behaviour; aggressive behaviour in the elderly; nursing behaviour as a contextual factor in aggressive behaviour; cognitive functioning in relation to aggressive behaviour; and finally the influence of the physical environment on aggressive behaviour.

Aggressive behaviour has been studied for many years, with recent studies emerging which examine the aggressive behaviour of the elderly. While the physical aspects of the environment and their effects have been studied over the

last 23 years, the environmental factors that are present when the elderly residents of nursing homes display aggression have not yet been studied.

This review has indicated that there is considerable evidence linking aggression and the environment; the elderly and aggression; and environment and behaviour. What has not been evident is a link between all three: the elderly, aggressive behaviour, and the physical environment.

This current study will explore the relationship between a change in environment (wall colour) and the aggressive behaviour of elderly residents of a nursing home. The level of cognitive functioning will be measured without excluding either cognitively impaired or cognitively intact individuals, recognizing that by virtue of choosing a particular unit in a nursing home there may already be severe cognitive impairment present.

III. CONCEPTUAL FRAMEWORK

The following conceptual framework (Figure 1) is based on the literature review. Within the model key elements of learned responses, cognitive functioning, environment, and nursing behaviour create a potential for aggressive behaviour. There are individuals who will not express aggression but a feedback loop is created that further contributes to a potential for aggression. Other individuals will express aggression with verbal, physical, or sexual behaviour. As in unexpressed aggression, expression of the behaviour will create a feedback loop creating further potential for aggressive behaviour.

Four elements have been identified as correlates of aggressive behaviour. The first, "learned responses", refers to the innate ability for all human beings to display aggressive behaviour (Brehm, 1966, Boettcher, 1983, Lanza, 1983, Meddaugh, 1990). Long standing behaviour patterns continue to operate across the life span and into illness states such as cognitive impairment (Ryden, 1988). For the purposes of this research, learned responses have not been measured.

"Cognitive function" refers to the ability of individuals to interpret environmental cues and to integrate this information with internal cues (Roberts & Algase,

1988). Research has suggested that aggressive behaviour is related to decreased cognitive functioning (Hamel et al, 1988, Roberts & Algase, 1988, Ryden, 1988, Ryden et al, 1991). Cognitive functioning was measured using the Mini-Mental State Examination (Folstein, Anthony, Parhad, Duffey & Gruenberg, 1985).

"Nursing behaviours" refer to the role played by nurses in establishing and maintaining a therapeutic and social milieu, and are based on studies suggesting that care plans and attitudes of nurses that empower residents and emphasize appropriate limits may actually reduce the frequency of aggressive behaviour (Blair & New, 1991, Feldt & Ryden, 1992, Kingdom, 1992, Morrison, 1989, 1990, Ryden, 1992). These nursing behaviours were measured indirectly using the Ward Atmosphere Scale (Moos, 1976).

The major focus of this research is on the "environment" element of the conceptual model. Specifically a change in the environment, that is wall colour, was studied to determine the relationship of these factors to the frequency of aggressive behaviour. The lighting was measured using a General Electric Light meter and photographs of the environmental colour were taken prior to painting and following the colour change using an Olympus OM-2 35mm camera (without a flash).

Unexpressed aggression cannot be observed or measured. Aggression expressed by each participant over the previous

six months, including verbal, physical and sexual aggression, was measured prior to the colour change using the Ryden Aggression Scale Form 1 (Ryden, 1988). Immediately prior to painting the environment, concurrent measures of the frequency of aggressive behaviour was measured over seven days using the Ryden Aggression Scale Form 2(RAS2) (Ryden et al, 1991). The frequency of expressed aggressive behaviour was measured a second time following the change in colour for a further seven days using the RAS2.

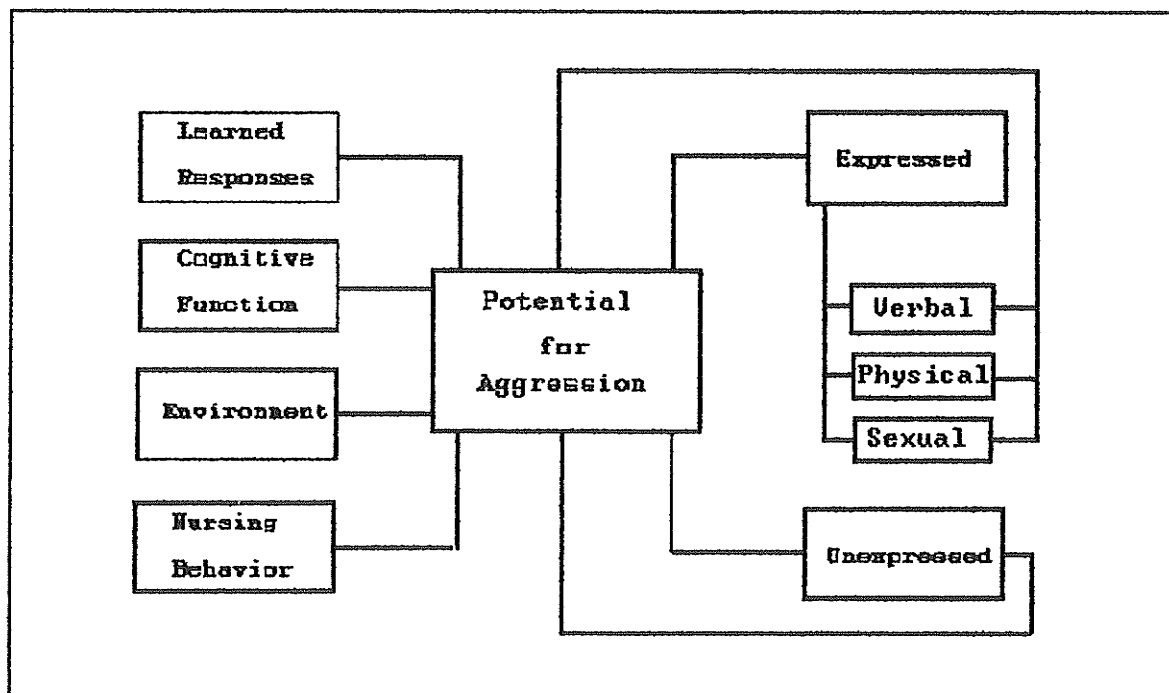


Figure 1: Conceptual Model: Aggressive Behaviour in the Elderly

(adapted from Lanza, 1983; Ryden, 1988)

This conceptual model is based on the current state of the literature, building on the earlier models of Lanza (1983) and Ryden (1988) (See Appendix 1 & 2). The model identifies critical elements and hypotheses derived from the model require systematic testing. A portion of this model, the relationship between the physical environment and the frequency of expressed aggressive behaviour was tested in this research. This research will contribute to knowledge of the relationship of factors in the physical environment such as colour and lighting to aggressive behaviour in the elderly.

The specific objectives of this research are:

1. To measure the frequency of aggressive behaviour before and after a change in the physical environment.
2. To examine the relationship between cognitive functioning and aggressive behaviour.
3. To examine the relationship between ward atmosphere and aggressive behaviour.
4. To examine the relationship between selected socio-demographic variables and aggressive behaviour.

IV. METHODOLOGY

The methodology used for this research is presented in five sections. In the first section the primary and secondary hypotheses are presented. Description of the study design, including the threats to internal and external validity is provided in the second section. The setting and sample characteristics of the respondents are outlined in the third section. Section four contains a description and discussion of the selected measures. The final section presents the procedure for data analysis.

1. Hypotheses

This research tested primary and secondary hypotheses. Using longitudinal data the primary hypothesis states:

The frequency of reported aggressive behaviour in a group of elderly residents who are exposed to a change in the environment (wall colour) will decrease significantly from pretest to posttest.

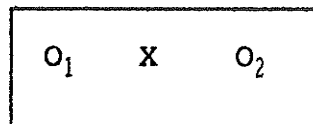
In addition, cross-sectional data are used to test the following secondary hypotheses:

- 1) There is an inverse relationship between cognitive functioning and aggressive behaviour.
- 2) There is an inverse relationship between positive ward atmosphere and aggressive behaviour.

2. Design of the Study

Experimental designs are suitable for testing cause and effect relationships among variables. In order to control for other possible explanations, true experiments must possess the following three properties: randomization, control, and manipulation. For this research the absence of randomization and a control group meant that a true experiment was not achievable. Instead, this research utilized a quasi-experimental design, that is, a one-group pretest-posttest design.

Schematic Representation of the Selected Design



"X" is the independent variable: (environment/colour)

"O" is the dependent variable: aggressive behaviour

Figure 2: The One Group Pretest-Posttest Design (Cook & Campbell, 1979)

Quasi-experimental designs measure a set of variables, manipulate the variable of interest and then measure the variables again (Cook & Campbell, 1979). This research was a natural experiment to test whether or not altering colour

in the physical environment of elderly residents of a nursing home affected the reported frequency of aggressive behaviour. The frequency of reported aggressive behaviour in a nursing home was measured, the paint scheme was altered, and the frequency of aggressive behaviour was measured again.

The strength of the one group pretest-posttest design lies in the ability to test the causal relationship between, for example, a change in environment and the frequency of aggressive behaviour of the elderly residents of nursing homes (Cook & Campbell, 1979). This design includes pretest data which allows for identification of pre-existing characteristics of the group (Kidder & Judd, 1986).

The major weakness of the one group pretest-posttest quasi-experiment is lack of a control group. For this research, the relationship between variables was examined cross-sectionally as well as longitudinally. Knowledge of cross-sectional relationships might be used to facilitate planning for the management of aggressive behaviour. Compared with laboratory research, the quasi-experiment conducted in the natural setting is more likely to represent the real world of nursing practice (Brink & Wood, 1989).

The independent variables, that is, the antecedents of aggression described in the Conceptual Model for Aggressive Behaviour, include: learned responses, cognitive functioning, environment, and the nursing behaviour in that

environment. The dependent variable, aggressive behaviour, is a consequence of these variables. In the pretest phase of the study the dependent variable, aggressive behaviour, was measured, as were two of the independent variables, cognitive functioning and environment. The independent variable, in this case the physical environment, was manipulated. The posttest phase of the study consisted of a second measurement of the dependent variable.

As outlined by Campbell and Stanley (1963) and Cook and Campbell (1979), several threats to internal and external validity are inherent for the one group pretest-posttest design. These threats are addressed in the subsequent section.

Internal Validity

Internal validity refers to the degree to which observed changes can be said to be the result of the experimental treatment (independent variable) rather than extraneous variables (Polit & Hungler, 1987). Eight different classes of extraneous variables pose a threat to the internal validity: history, maturation, testing, instrumentation, statistical regression, selection, experimental mortality, and interactions between classes of variables (Campbell & Stanley, 1963). For the one group pretest-posttest design, the major threats to internal validity of interest are history, maturation, testing effects and experimental mortality. Brief comments are made

regarding the remaining three classes of extraneous variables: selection, instrumentation, and regression effects.

1. History

The major threat to validity for the one group pretest-posttest design is the effect of history, that is, the possibility that events other than the intervention have influenced the dependent variable in the period between the pretest-posttest measures (Cook & Campbell, 1979). Two primary concerns need to be addressed. First, of concern is the amount of time that passes between measurements that allows for the influence of other events. For this research the amount of time between measurements was ten weeks, the minimal time afforded for data collection given the constraints of a natural experiment. The timing of the painting changes were controlled by external factors. The second concern relates to the monitoring of events external to the treatment that might possibly influence the frequency of aggressive behaviour. An example of this might be that a new unit co-ordinator may be appointed, several residents might die, or there may be a new chairperson elected to the Board of Directors. These factors could have an impact on the social environment of the facility which could alter the number of aggressive incidents that are observed. Alert to the threat of history on internal validity, every attempt

was made to anticipate other pertinent events and to report such events if they occurred.

2. Maturation

Maturation refers to processes that occur within subjects during an investigation as a result of the passage of time rather than as a result of the experimental intervention (Polit & Hungler, 1987). Over the long period, elderly residents of nursing homes may exhibit a change in frequency of aggressive behaviour due to increased frailty, progression of chronic disease, acute illness, or trauma. This research was not lengthy, however, incidents of acute illness, trauma and change in dependency level were monitored as the research progressed.

3. Testing effects

Testing effects refers to the effect of taking a test upon the scores of a second test (Polit & Hungler, 1987). For the one group pretest-posttest design, testing effects must be carefully evaluated. For this research, the major question is, did the data collection procedure for aggressive behaviour at pretest influence the data collected for aggressive behaviour at posttest. The planned timing of the pretest and the posttest is important as the impact of this "testing effect" is greatest when the time between the pretest and posttest is very short. Did the staff become more sensitive to occurrences of aggressive behaviour from

the pretest and then over-report (or under-report) the occurrence of aggressive behaviour at posttest?

The aggressive behaviour data, both at pretest and posttest, were collected from the staff who were working on the unit on the various shifts for the seven day period. Staff rotations, planned days absent, and staff illness taken together meant that for the seven days in succession, staff members changed depending on the day and the shift. It would be impossible, given a six day rotation of days off, to have the same staff on duty for the entire data collection period. In addition, the staff did not know the exact research hypotheses.

Finally, the retrospective measure of aggressive behaviour provided a baseline for the aggressive behaviour measured at pretest and posttest. Testing effects would be demonstrated if each of the measures of aggressive behaviour would form a straight line on a graph. Testing effect is not as clear if the retrospective measure of aggression and the concurrent measure of aggression at time one are similar and a change, either an increase or decrease, is demonstrated in the concurrent measure of aggression at time two (Cook & Campbell, 1979).

4. Experimental mortality

Experimental mortality refers to the attrition of subjects from the study (Campbell & Stanley, 1963). Research conducted with residents of nursing homes is

likely to encounter residents who are transferred out of the facility due to illness, some may die, some may drop out of the study for personal or family reasons. For this research, the group for pretest and posttest measures remained intact.

5. Selection

Selection bias occurs when the composition of the group changes suddenly at the time of the intervention, often because of attrition relating to the intervention itself (Cook & Campbell, 1979). For this research selection is not a major concern for internal validity. The pretest and posttest groups are the same, representing repeated measures of aggressive behaviour (n=27).

6. Instrumentation

Instrumentation can be a threat to internal validity if the instruments used at time one are not identical to the instruments used at time two (Kidder & Judd, 1986). In this research instrumentation is not a major problem because the pretest and posttest tool was identical (the RAS2); the tool has reported validity and reliability; and the tool was pretested on a similar but different sample of nursing home residents.

7. Regression

Regression toward the mean is the tendency for the extreme scores of a test to move closer to the mean when the test is repeated. The risk of regression effects are

particularly likely when a group has been selected because of their extreme (high or low) scores. For this research, if extremely aggressive residents had been placed on the testing unit, then it could be expected that scores at second testing would indicate less aggressive behaviour simply because scores were initially so high. For this research, while some residents might be consistently more aggressive than others, the unit as a whole was not designated for aggressive residents.

External Validity

External validity refers to the ability of the research design to produce results that can be generalized to target persons, settings and times; and generalized **across** types of persons, settings and times (Brink & Wood, 1989). Natural experiments are less intrusive upon conditions in natural settings, less artificial and as such are thought to represent the real world of nursing practice (Brink & Wood, 1989). The factors that may affect external validity are related to selection, reactivity and testing. These same factors pose threats to internal validity and as such threaten the validity of the relationship between dependent and independent variables within the study. For external validity, threats to validity are examined in terms of the generalizability of the relationship between dependent and independent variables outside the study.

Threats to external validity are essentially based on interactions, that is, if there is an interaction between intervention and the setting, it cannot be said that the results would hold if the project were carried out in another setting (Cook & Campbell, 1979). For this research, the major threats to external validity are: interaction of selection and intervention, interaction of setting and intervention, interaction of testing and intervention, and reactivity.

1. Interaction of selection and intervention

Interaction of selection and intervention refers to treatment effects that apply only to the kinds of individuals who participated in the study. Can the relationship between the dependent variable aggression and selected independent variables be generalized to other categories of nursing home residents? This threat occurs when the inclusion criteria are very unusual, resulting in a sample of "exclusive" individuals. The inclusion criteria for this research are that residents must have lived on the unit undergoing the environmental change for at least eight weeks prior to data collection, be older than 55 years of age, and have a medical as opposed to a psychiatric primary diagnosis. Socio-demographic characteristics will be described in the third section of this chapter setting and sample characteristics.

2. Interaction of setting and intervention

Interaction of setting and intervention refers to findings that are applicable only to the specific setting of the study. Settings vary in their ability to respond or adapt to change, which alters the ease with which a treatment or experimental approach may be introduced in the setting. The results may reflect this aspect of the setting as opposed to real treatment effects, reducing the generalizability of the results to other settings (Brink & Wood, 1989). For this research, the intervention represents painting the environment a different colour. Procedural changes, or changes in approach to the residents on the unit are not involved in this research thus reducing the threat that this interaction represents.

3. Interaction effect of testing and intervention

This interaction is a result of the awareness of certain issues or events that is heightened due to exposure to the pretest. The response to the intervention is more a function of having been exposed to the pretest. The measurement process for this research may provide this type of effect if it sensitizes the individuals to the fact that their aggressive behaviour is being monitored, and as a result of the monitoring, the behaviour is reduced. While the presence of the researcher may be obtrusive, the concurrent measure of aggression (RAS2) is an unobtrusive measure and this, coupled with cognitive impairment, makes

it unlikely that residents will be aware of the measurements.

4. Reactive effects

This threat to external validity of experimental procedures is more commonly known as the "Hawthorne Effect", that is, it is change itself, rather than the specific intervention, that results in a change in the dependent variable (Brink & Wood, 1989). The new wall colour in the environment in this research may have such an effect on resident's aggression that any change would have produced a change in the frequency of aggression (Polit & Hungler, 1987). Repeated measures would address this threat to some extent, as change produced in this way is short lived, but was not feasible within the resources available for this study.

In addition, reactive effects may influence the staff who are providing detailed information about aggressive behaviour. They may feel special and this positive feeling may lead to more tolerance for aggressive behaviour and perhaps under reporting of the behaviour or the staff may be sensitized to the behaviour and increase reporting. As with the residents it was noted that change produced in this way is generally short lived. Repeated measures would control for this threat but were not feasible.

3. Setting and Sample

This research was conducted in Winnipeg, Manitoba, a city located on the Canadian prairies. The population of Winnipeg is approximately 600,000. The setting for the study was a medium sized (100 beds) urban personal care home located in a quiet residential neighbourhood. Within the province, all applicants for nursing home placement are screened by a provincial government panel of professional caregivers to ensure appropriate care facilities are available. This system is often referred to as "single entry". Each facility within the province, 34 in total, has some flexibility in screening applicants for admission such that the facility is certain it can meet the care needs of the applicant.

The facility used in this research has a reputation for accepting all applicants for admission, including those who display aggressive behaviour. It is a proprietary facility, and part of a small chain of personal care homes in Manitoba.

There are 51 beds on the unit undergoing changes in the physical environment. At pretest, the walls and light fixtures were painted a dark blue on one hallway and deep orange on the second hallway. The corridors had large fluorescent down-lighting fixtures which created pools of light and dark along the length of the hallway. A floor plan

of the unit and photographs of the corridors are included in the Appendix (3&4).

Inclusion criteria for the study consisted of all the residents on this unit 55 years of age or older, with a medical diagnoses (as opposed to psychiatric diagnoses), who have lived in the facility more than eight weeks prior to data collection. Cognitively impaired residents were included in the study only if the legally responsible person provided written consent. An effort was made to contact all seventeen of the nursing staff of this same unit (Registered Nurses, Licensed Practical Nurses, and Nursing Assistants), who were employed on a regular basis, either full-time or part-time. Each staff member was asked to complete a ward atmosphere scale and a record of previous aggressive behaviour for each resident who agreed to participate. The unit has a total population of 51 residents. The legally responsible persons for thirty residents agreed to participate along with all seventeen staff members.

The intervention consisted of changing the colour on the walls to an off white with contrasting blue-green colour on the doors and a darker shade of blue-green on the door frames. The pretest lighting conditions were measured at selected locations, indicated on the floorplan in appendix (3 &4), in the corridors and resident rooms using a General Electric Light Meter. Photographs were taken with an Olympus OM-2 35mm camera without using a flash.

4. Measurement

The Conceptual Model for aggressive behaviour in elderly residents of institutions suggests that there are four "origins" of aggressive behaviour, or independent variables: learned responses, cognitive functioning, environment, and nursing behaviour in that environment (adapted from Lanza, 1983, Ryden, 1988). The manifestation of aggression, or the dependent variable, is identified in the model as expressed aggression in the form of physical, verbal, or sexual aggression. The study will collect cross-sectional data on two of the independent variables, cognitive functioning and environment, and longitudinal data on the dependent variable, aggressive behaviour. Data will not be collected on the remaining two independent variables, learned response and nursing behaviour.

Aggressive behaviour has been operationally defined as hostile action toward other persons, objects or towards the self including biting, elbowing, hitting, punching, kicking, pinching, squeezing, pushing/shoving, pulling hair, scratching, slapping, spitting, tackling, making threatening gestures, throwing and object, brandishing a weapon, striking a person with an object, using a weapon, aggression toward property, damaging property, cursing/ obscene language, hostile language, verbal threats, name calling, and sexually aggressive behaviours such as hugging, intercourse, obscene gestures, or touching of body parts of

another person without the expressed will and or despite the resistance of the other person (Ryden, 1988, 1991).

The instruments that were used to collect data are the Ward Atmosphere Scale (WAS)(Moos, 1974); the Ryden Aggression Scale Form 1 & 2 (RAS1 & RAS2)(Ryden, 1988, 1991); and the Mini-Mental State Examination (MMSE)(Folstein, Folstein & McHugh, 1975). Socio-demographic data such as age, diagnosis, length of stay in the institution, and current medications were gathered on a form prepared for this study.

Ward Atmosphere Scale

The Ward Atmosphere Scale (WAS) was developed to measure the social climates of psychiatric treatment programs as perceived by the staff and patients within the theoretical framework of "the person-environment fit" (Moos, 1974). The original Form A WAS was a 206 item scale prepared using data collected from direct observations on three separate units by two trained observers. The instrument was refined over a period of years by testing each successive form of the WAS: Form B (120 items), Form C (100 items) and finally Form S (40 items). The instrument was tested in over 174 different units involving over 1000 subjects (Moos, 1974). Ten subscales were identified using a combination of rational derivation and factor analysis: involvement, support, spontaneity, autonomy, practical orientation, personal problem orientation, anger

and aggression, order and organization, program clarity, and staff control. (See Appendix 5 for complete descriptions of the subscales and Form S of the WAS.)

The WAS Form S has 40-items to which the respondent answers true or false. Each of the 40 items has an assigned true or false score and is valued at one point if the subject's response matches this assigned true or false. The result is an overall score for the environment and scores for each of the ten subscales. High scores indicate a more positive ward atmosphere, while low scores indicate a more negative ward atmosphere.

The WAS Form S was modified for this research by substituting "resident" for "patient" and by substituting two items from the same subscale of WAS Form C for two items on the Form S. The item "Staff strongly encourage residents to talk about their pasts" was substituted for "Patients hardly ever discuss their sexual lives". The item "Most residents follow a regular schedule each day" was substituted for "The ward sometimes gets very messy". These modifications reflect the residential nature of the nursing home setting which values not only openness and support but also the privacy extended to individuals as would be extended to them in their own homes. The following is an example of the format for this instrument:

T F 14. Very few residents have any responsibility on the ward. (Moos, 1974)

Moos (1974) reported that WAS profiles are extremely stable over time even if different staff or patients complete the WAS on test-retest. Friies (1986) examined the WAS Form S for reliability and validity and concluded that the WAS had acceptable reliability and validity for both patients and staff; criterion oriented and construct validity were acceptable; and the WAS possessed excellent cross-cultural properties. The reliability and validity of the WAS is generally reported according to each of the subscales (Friis, 19986, Moos 1974). For example, test-retest reliability for the subscale Anger and Aggression for patients is reported as .71 and for Involvement .79 (Moos, 1974). The WAS will be used to measure the psychosocial environment.

Ryden Aggression Scale Form 1

The Ryden Aggression Scale Form 1 (RAS1) (1988), is a 25-item Likert-type scale, which was designed as a retrospective measure of aggressive behaviour. The instrument is completed by a professional caregiver and provides a measure of the frequency of aggressive behaviour the individual has displayed in the past. The RAS1 six point Likert-type scale was modified for this research to become a four point scale as the original form reviews the previous year while only the previous six months were reviewed in this research. The original six point Likert Scale options were never (0), less than once a year (1), one

to eleven times per year (2), one to three times per month (3), one to six times per week (4), and one or more times daily (5). The literature suggests that aggressive behaviour is consistent through time (Boettcher, 1983, Convit et al, 1990, Lanza, 1983, Meddaugh, 1990, Morrison, 1989). An example of an item from this instrument is:

	0	1	2	3
2. Slapping	never	1-3 times	1-6 times	1 or more
		a month	a week	times daily

(Ryden, 1988)

The respondent circles the statement that best describes how often the resident demonstrates a particular behaviour.

(See Appendix 6 for the complete RAS1.) The result is an overall single score and three sub-scores for physically aggressive behaviour, verbally aggressive behaviour, and sexually aggressive behaviour. The reliability on re-test with family caregivers was .86 (n=31); and internal consistency was .88 for the overall scale (n=166) (Ryden, 1988). In a Canadian study by Hamel et al (1989) the RAS1 was reported to have a test-retest reliability of .86.

Ryden Aggression Scale Form 2

The Ryden Aggression Scale Form 2 (RAS2) is an adaptation of the RAS1 which provides for direct observation of **aggressive behaviour** (Ryden et al, 1991). (See Appendix 7 for the complete RAS2.) It is important to the context of this study to have retrospective data to determine whether

or not the historical frequency of aggressive behaviour for individuals differs from the frequency of aggression as measured by the RAS2. The same 25 behaviours from the RAS1 are listed on a tally sheet, along with two additional items, in Form 2 with enough space to record the numbers of times a behaviour occurs during two eight hour periods. The two additional items are pulling hair and aggression toward property. The RAS2 was modified for this research to provide space to record the behaviours in three eight hour periods (24 hours). The frequencies of each behaviour are totalled for the sub scales: physical, verbal, and sexual aggression as well as for each 24-hour period. The inter-rater agreement for this scale was reported as .88 (Ryden, 1991). Ryden et al (1991), report that the RAS1 and the RAS2 were used with the same sample with a correlation of 0.65 ($p > 0.001$). When RAS2 scores were compared with a second behaviour rating score using a Quality Assurance staff evaluation the Pearson product moment correlation was 0.34 ($p < 0.001$)(Ryden et al, 1991). This instrument is relatively recent in development and publication and is not currently in widespread use.

Mini-Mental State Examination

The Mini-Mental State Examination (MMSE), a clinical aid that measures **cognitive functioning**, was developed by drawing on items from previous clinical aids (Folstein, Anthony, Parhad, Duffy & Gruenberg, 1985). The MMSE is a

brief screening test assessing language and motor skills, orientation, and memory (Folstein, Folstein, & McHugh, 1975). (See Appendix 9 for the complete MMSE.) The MMSE is administered in a one to one situation, where distractions and interruptions are kept to a minimum. A sample question from the MMSE is:

"Can you tell me where we are right now? For instance what province are we in?" (Folstein et al, 1985).

The scale provides a cumulative score which can range from zero to thirty where thirty means there were no errors on the test and zero means there were no correct responses on the test. A low score on the MMSE, less than twenty-four, and in some research less than seventeen, out of thirty, is indicative of global cognitive impairment (Bromby, 1991, Brokenshire, 1987, Folstein et al, 1985). The instrument has been shown in clinical trials to have high inter-rater reliability and to be significantly correlated to medical tests for neuropathology. The inter-rater reliability has been reported as .83 (Bromby, 1991). The MMSE is widely used as both a clinical and research tool.

Socio-demographics

Socio-demographic data including age, gender, length of stay in the facility, medical diagnoses, and number of

current medications was collected for each participant. (See Appendix 8 for the form used to collect this information.) Residents with psychiatric diagnoses such as schizophrenia, manic depression, and paranoia, have been excluded from this study these psychiatric diagnoses have been shown to influence the amount of aggressive behaviour and including these residents in the study could introduce confounding factors (Lanza, Milner & Riley, 1988, Convit et al, 1990).

5. Procedure

In November 1992 a medium sized personal care home (100 beds) in Winnipeg, Manitoba was approached as a possible research site. The Facility's Board of Directors considered the proposal and approved the project in December of 1992. Ethical approval was obtained in January, 1993 by the Ethical Review Committee of the Faculty of Nursing University of Manitoba. Following this approval presentations were made to the Unit Manager, and nursing staff to gain support for the research and to provide an opportunity for questions. The WAS, the RAS1 and RAS2, were pretested at a different facility to identify any concerns or difficulties with any of the tools, before the data were collected.

The legally responsible person for each resident was contacted by letter and invited to participate in the study. Follow-up telephone calls were made to answer any questions

and to book an appointment for an interview. The families were free to choose the location of the interview and many chose their own homes. The legally responsible persons for the residents provided a signed a consent form for each resident in the study.

During an interview with the researcher, the legally responsible person for each resident completed the WAS, and the socio-demographic data sheet. Residents who were deemed able to complete a WAS were encouraged and assisted to do so. Each resident was interviewed by the researcher to complete a MMSE. The time estimated to complete these tools was about 30 minutes.

Nursing staff were asked to complete a RAS1 on all the residents in their care who had agreed to participate. (The RAS Form 1 and 2 was not completed by residents or their legally responsible person.) In addition, each nursing staff member completed a WAS. The time estimated to complete both tools was about 30 minutes.

Following completion of the consent forms, the WAS, the MMSE, the socio-demographic data and the RAS1, the researcher attended change of shift report for a period of seven days at 0715 hours, 1515 hours and 2215-2300 hours (May 3 to May 10, 1993) to complete the RAS2 with information provided by the nursing staff (pretest). In addition, any change in dependency level, acute illness, or trauma was noted during the data collection period.

The environmental change (intervention) was made and then once the unit manager was satisfied that the routine of the unit had been reestablished, the researcher attended change of shift report as before for a further seven days (July 22 to July 29, 1993)(posttest). All incident reports involving aggressive behaviour during the pretest and posttest periods of observation would have been examined by the researcher and included on the RAS2 for the day that the incident occurred, but none was filed. As before, any change in dependency level, acute illness, or trauma was noted.

6. Data Analysis

Data were entered in a Statistical Package for the Social Sciences for a Personal Computer (SPSS-PC) computer program. The measurements used in this study produced nominal, ordinal, interval and ratio data. Statistical tests appropriate to the level of measurement were used for analysis. The plan of analysis was specific to the hypothesis being tested and included both univariate and bivariate analysis.

Longitudinal Data

The primary hypothesis states:

The frequency of reported aggressive behaviour in a group of elderly residents who are exposed to a change in environment (wall colour) will decrease significantly from pretest to posttest.

This hypothesis was tested by initially examining frequencies and scatterplots of the values for RAS2 at time one and RAS2 at time two. A scatterplot shows how the values of one variable are related to the values of another variable. The assumptions for parametric procedures, that is normal distribution, were not met. Instead distribution free, non-parametric tests, Spearman Rank Correlation Coefficient and Wilcoxon Matched-Pairs Signed Ranks Test, were used.

The Spearman Rank Correlation Coefficient is a distribution free test that is used to measure the degree of linear association between the ranks of two variables (Shott, 1990).

The Wilcoxon Matched-Pairs Signed Ranks Test is used for paired observations, such as pretest-posttest observations for several subjects, to determine if the second set of measurements in the pair has the same median as the first set of measurements (Conover, 1971). This test is the non-parametric equivalent of the paired t-test.

Cross-sectional Data

The secondary hypotheses state: 1) There is an inverse relationship between cognitive functioning and aggressive behaviour.

2) There is an inverse relationship between positive ward atmosphere and aggressive behaviour.

Correlational analysis was used to determine whether variables are associated with one another. Frequency distributions of the MMSE, WAS, and RAS2 at time one were examined. While each instrument provides ratio level data, making the Pearson Correlation Coefficient appropriate to measure the degree to which these variables are linearly related, the non-normal distribution made the **Spearman Rank Correlation Coefficient** more appropriate (Shott, 1990). When the distributions of the variables are non-normal the Spearman Rank Correlation Coefficient is used in place of the Pearson Correlation Coefficient to measure the degree of linear association between the ranks of two variables.

The socio-demographic data: age, gender, length of stay and medication are additional cross-sectional data which were examined for a relationship with the RAS2 at time one. The Spearman Rank Correlation Coefficient was used to examine the relationship between age, length of stay, and medications and aggressive behaviour as measured at pretest using the RAS2. Spearman Rank Correlation Coefficient was also used to test for a relationship between the retrospective frequency of aggression, as measured by the RAS1, and the frequency of aggressive behaviour, as measured by the RAS2, at time one.

Gender is a categorical variable with two possible values. Aggression was converted to a categorical variable using the values of zero for no aggressive behaviour and one

for any frequency of aggressive behaviour. With this conversion of data the Chi-square was then appropriate to explore differences in the frequency of aggressive behaviour in relation to gender (Shott, 1990). The Chi-square test is a common non-parametric statistic used when data are nominal.

Summary

The methodology used in this research was presented in five sections. The primary and secondary hypotheses followed by the description of the study design, including the threats to internal and external validity were provided in the first and second section. The setting and sample characteristics of the respondents were outlined in the third section. A description and discussion of the selected measures was presented in the fourth section and the fifth section presented the procedure for data analysis. The findings of this research are described in the next chapter.

V. RESULTS

This chapter will begin by outlining the protocol for data collection from initial contact to completion of the research. The sample is described, including response rates. The socio-demographic data are presented in summary form. The reliability of each of the instruments used in this research: the Ryden Aggression Scale form 1 and 2 (RAS1 & RAS2)(Ryden, 1988, 1991), the Mini-Mental State Examination (MMSE)(Folstein, Anthony, Parhad, Duffey & Gruenberg, 1985) and the Ward Atmosphere Scale (Moos, 1974) are presented next and discussed. Following this, the results of the analysis of the primary and secondary hypotheses are presented. The chapter concludes with a summary of the findings.

1. Protocol

Data collection occurred in phases over a seven month period beginning mid-January 1993 and ending mid-July 1993. Diminished cognitive functioning meant that none of the residents living on the unit undergoing the changes could provide their own consent. In view of this, in the first phase, each of the legally responsible persons for the residents living on the unit were contacted by letter inviting them to participate in the study (n=50). (See Appendix 11 for a copy of the letter.) A follow-up

telephone call was made beginning three days after mailing and continuing until all legally responsible persons had been contacted. During the telephone call any questions that the legally responsible person had were answered and an appointment for an interview was made. Three legally responsible persons provided consent to participate but declined completing the WAS.

The interviews were conducted at either the nursing home or in the home of the legally responsible person. During the interview the legally responsible person signed the consent form, completed the WAS and the socio-demographic data. The contents of the MMSE was shared with the legally responsible person to be sure they understood the kinds of questions the resident would be asked.

The second phase began once consent had been provided. Each resident was visited in the nursing home to complete the MMSE. Three residents completed both the WAS and the MMSE on the advice of the legally responsible person. As a result there were 30 completed MMSE, 27 completed WAS, and 30 socio-demographic profiles.

The third phase began when all the legally responsible persons had completed the WAS, and all the residents had completed the MMSE. The nursing staff on the unit were asked to complete a WAS as well as a RAS1 for the residents they had cared for in the past six months. Photographs were

taken and light levels were measured in April 1993 to provide for comparison after the painting.

Following this, the researcher attended each of the three daily change of shift reports from May 3 through to May 10, 1993 (pretest). The staff going off duty met with the researcher who completed an RAS2 for the thirty residents participating in the study. May 11, 1993 professional painters began making the changes to the unit. The researcher returned for seven more days July 22, 1993 through to July 28, 1993, for the final phase (posttest) of the study. At the end of each of the three shifts, staff going off duty met with the researcher who completed the RAS2.

2. Sample Characteristics

While the resident unit has 51 beds, there was one resident who was competent and provided consent to participate but was subsequently moved to another unit prior to the first seven day collection of the RAS2, thus the data collected from this individual are not included in the results. The legally responsible person for each of the remaining fifty residents who live on the unit undergoing the changes were invited to participate in the study. The Province of Manitoba's Public Trustee was responsible for nine of the residents and consent for participation could not be obtained for these residents, bringing the potential

sample size to 41. There were six residents who fit the exclusion criteria of a primary psychiatric diagnosis, reducing the potential sample size to 35. There were five legally responsible persons who refused to participate for personal reasons, leaving a potential sample size of 30. Although there were 30 residents who participated in all phases of the study, during the ten weeks of painting, between pretest and posttest, three residents experienced traumatic injuries resulting in fractures. The data from these three residents were excluded from analysis, leaving a final sample size of 27.

The five legally responsible persons who refused to participate gave the following reasons for non-participation:

1. The resident that they were responsible for was too confused to understand what was going on;
2. The resident was too frail to be disturbed by the researcher;
3. The legally responsible person was too upset by the decision to place the resident in the nursing home to consider participation in the research.

All staff members ($n = 17$) who work on the unit undergoing the changes on a regular basis completed the Ward Atmosphere Scale and the Ryden Aggression Scales Form 1 for 30 residents. The forms were completed during work hours in

the library of the nursing home. The RAS2 was completed by the researcher as described in the previous section.

Resident Demographics

The socio-demographic data for the 27 residents are summarized in Table 1. The majority of the sample were female (74%, $n = 20$), as would be expected among the elderly in general and in personal care home populations in particular, and 26% ($n = 7$) of the sample were male. The age of residents ranged from 70 to 97 years, length of stay varied from one to ten years, and the frequency of medications ranged from zero to five. (Information on the type of medication was not collected.) The most frequent diagnosis was Alzheimer's Disease (51.9%), followed in rank order by dementia (22.2%), cerebrovascular accident (CVA) (18.5%), arthritis (3.7%) and Parkinson's disease (3.7%) ($n = 27$).

Table 1. Summary of Socio-demographic Data

Variable	Mean	Std Dev	Minimum	Maximum	N
Age (yrs.)	83.9	8.1	70	97	27
Length of Stay (yrs.)	3.4	2.1	1	10	27
Number of Medication Prescriptions	2.0	1.3	0	5	27

During the seven months of data collection there were no outbreaks of acute illness such as influenza and gastroenteritis. Staffing, administration, and unit organization were unchanged from pretest to posttest.

3. Reliability

Reliability for each of the research instruments was assessed by examining the internal consistency of each instrument using Cronbach's alpha. Cronbach's alpha measures the extent to which different subparts of an instrument are equivalent in terms of measuring the critical attribute. The results are presented in Table 2.

Table 2. Reliability

Cronbach's Alpha for Research Instruments.

MMSE	.98
WAS	.85
RAS1	.93
RAS2 (O ₁)	.45
RAS2 (O ₂)	.71

The analysis of the use of parallel forms of the Ryden Aggression Scale are presented along with the results of the cross-sectional hypotheses tests.

Respondents indicated several difficulties with the WAS. For example, many of the participants had difficulty choosing true or false as a response to many of the items.

Family members stated they were not sure of the "correct" response and staff members suggested that the responses would vary depending on individual residents. There were sixteen of forty items (40%) on the scale where 20% or more of the respondents were unable to choose true or false (n=44). There were 43.3% of respondents who did not select either true or false for the item "New treatment approaches are often tried on this unit". Further evaluation of this instrument for use in long term care and nursing home settings is warranted.

A comment is necessary about the low Cronbach's Alpha for the RAS2 at time one. This is a relatively new instrument and further research is needed before specific conclusions can be made about its reliability. Ryden et al (1991) used this instrument in a recent descriptive study but did not include the Cronbach's Alpha in the published report. The more respectable value for Cronbach's Alpha for RAS2 at time 2 should be noted. Although the value of the Cronbach's Alpha can be altered by deleting items from the scale, a decision not to delete items was based on the rationale that the values of zero for particular items has meaning within the context of this research. The fact that a particular behaviour may or may not occur at pretest or posttest is important to consider when evaluating the impact that a change in environment has on the frequency of aggressive behaviour. As a result of this rationale, the

RAS2 scale was maintained intact and the results interpreted cautiously.

4. Primary Hypothesis

The primary hypothesis states:

- 1) The frequency of reported aggressive behaviour in a group of elderly residents who are exposed to a change in the environment (wall colour) will decrease significantly from pretest to posttest.

The frequency of aggression by resident, as measured by the Ryden Aggression Scale Form 2 (RAS2), from pretest to posttest is presented in Table 3. The RAS2 provides ratio level data but, as a review of frequencies and scatterplots identified the non-normal distribution of the findings, non-parametric tests were used to test the hypothesis of a decrease in aggressive behaviour from pretest to posttest.

The pretest-posttest aggression scores were analyzed using a Spearman Rank Correlation Coefficient and a Wilcoxon matched-pairs Signed-ranks test. The results of these tests are presented in Table 4.

The Spearman Rank Correlation Coefficient was used as a preliminary test to measure the degree of linear association between the ranks of pretest and posttest aggression frequencies. The result is a statistically significant ($R=.58$; $p=.01$) positive relationship, indicating that the two measures are not independent. Based on this, the

primary hypothesis of a decrease in frequency of aggression from pretest to posttest is not supported.

The Wilcoxon Matched-Pairs signed-Ranks Test is used for pretest-posttest observations to see if the second set of measurements in the pair has the same median as the first set of measurements. The differences from pretest to posttest are calculated and the median of the new group of scores is calculated. The result ($Z = -.98$; $p = .33$) indicates there is no statistically significant difference in the two sets of scores, in other words there is no change. The hypothesis that the frequency of reported aggressive behaviour in a group of elderly residents who are exposed to a change in colour will decrease significantly from pretest to posttest is not supported.

Careful examination of the raw scores (see table 3) is highly suggestive of differences from pretest to posttest for specific individuals. A change in the frequency of aggression from pretest to posttest, either an increase or a decrease, is observed in 44% of the residents. Some residents experienced dramatic reductions in aggressive behaviour, for example from 26 to three, and others dramatic increases, such as 27 to 40. Factors, other than the intervention, need to be explored. Further examination of expanded contextual factors such as learned responses, disease stage, psychosocial environmental factors, and

Table 3. Frequency of Aggression as measured by RAS2.

Pretest	Posttest	Change
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	1	1
0	1	1
0	1	1
0	1	1
0	3	3
0	3	3
0	5	5
1	0	-1
2	33	31
8	0	-8
12	26	14
13	5	8
15	14	-1
16	0	-16
18	32	14
25	32	7
26	3	-23
27	40	13

environmental variables other than colour may, on an individual basis, provide explanations for the direction and magnitude of change. In terms of disease stage, victims of Alzheimer's Disease, for example, progress through three different stages of the disease (Barrow, 1989). The first stage of the disease is characterized by recent memory loss and personality changes, lasting up to four years. Typical behaviours at this stage include getting lost while walking in a familiar location. The second stage brings more memory loss and drastic mood swings, speech becomes difficult and responses are more unpredictable. The final, terminal stage, lasts about one year or less. The individual often no longer speaks or eats, but responds to direct contact. Depending on the progression of the disease, individuals may exhibit different responses to environmental change. A case by case examination of additional contextual factors might explain the differences in direction of change for individuals.

Table 4. Statistical Analysis Pretest/Posttest.*Spearman Rank Correlation Coefficient*

Correlations:	Pretest	Posttest
Pretest	1.00	.58
Posttest	.58	1.00
N of cases = 27		p = .01

Wilcoxon Matched-Pairs Signed-Ranks Test

Mean Rank	Cases	
10.50	6	-Ranks (less than)
9.00	12	+Ranks(greater than)
	<u>9</u>	Ties
	27	Total
Z = -.98	p = .33	

5. Secondary Hypotheses

Cross-sectional data was used to test the following secondary hypotheses (at time one, prior to the intervention):

- 1) There is an inverse relationship between cognitive functioning and aggressive behaviour.
- 2) There is an inverse relationship between positive ward atmosphere and aggressive behaviour.

Cognitive functioning was measured by the Mini-Mental State Examination. The MMSE was administered by the researcher to 30 residents, with 27 cases included in this analysis. The highest possible score on the MMSE is 30, with the clinical cutoff point of 24 indicative of global impairment (Folstein et al, 1975). In some research a cutoff point of 17 has been used (Folstein et al, 1985). All 27 residents scored below either cutoff point, as indicated in Table 5.

Table 5. Mini-Mental State Examination

<u>Value</u>	<u>Frequency</u>	<u>Percent</u>
0	16	59.3
2	3	11.1
4	1	3.7
10	2	6.7
13	3	10.0
16	2	6.7
Total	27	100.0

Mean = 3.77

Standard Deviation = 5.48

The relationship between cognitive functioning (as measured by the MMSE) and aggressive behaviour (as measured by RAS2) was tested using the Spearman Rank Correlation Coefficient, and CHI square, in addition the two variables were graphed on a scatterplot. The Spearman Rank Correlation Coefficient was used to measure the degree of linear association between the ranks of cognitive functioning and pretest aggression frequencies. The null hypothesis for the Spearman Rank Correlation Coefficient Test, that the variables are

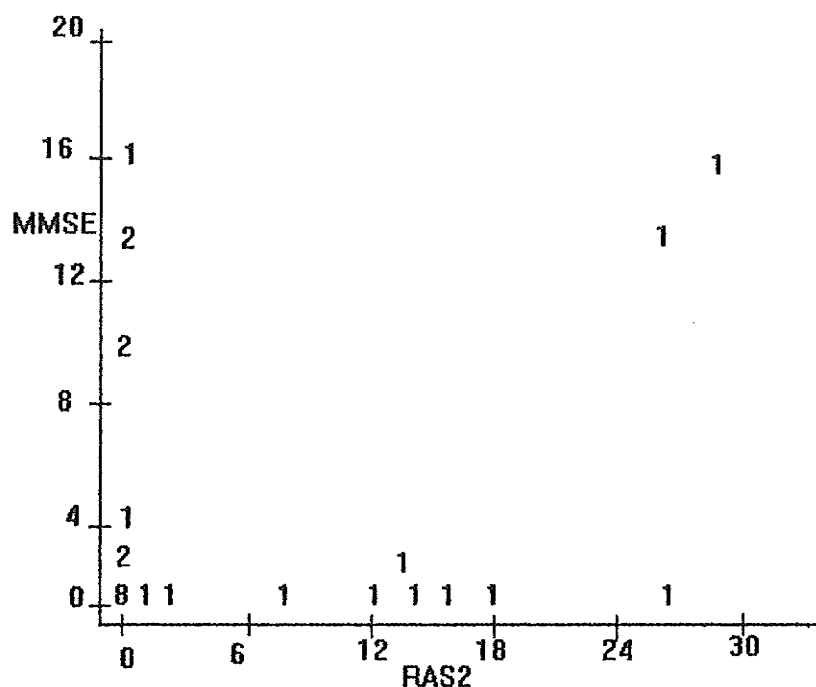
independent, can not be rejected without a statistically significant value for r (see Table 6). Therefore, there is no support for an inverse relationship between cognitive functioning and aggressive behaviour.

Chi-square is used to test for relationships between discrete variables (Shott, 1990). The values for the MMSE were transformed into discrete variables by placing all the zero values in one category and all other values in a second category. The values for RAS2 were also converted to discrete variables by placing the zero values in one category and any other value in a second category. The null hypothesis for the Chi-square test is that there is no association between the row variable and column variable. The Fisher's Exact Test is used when the expected frequencies are small, less than five, and both variables have only two categories. Chi-square and Fisher's Exact Test evaluate the same hypotheses. The null hypothesis can not be rejected without a statistically significant value for χ^2 , thus, once again, there is no support for an inverse relationship between the cognitive functioning and aggression.

Table 6. Tests of Correlation between MMSE and RAS1 & RAS2.

Test MMSE with:	<u>RAS2</u>	
Spearman Rank Correlation		$r = -.10$ ($p = .63$)
CHI-square	1.3($p = .23$)	
Fisher's Exact Test	one tail	$p = .22$
	two tail	$p = .43$

Table 7. Scatterplot of MMSE with RAS2



The scatterplot suggests an interesting relationship between cognitive functioning and aggressive behaviour. There appears to be competing conclusions to be drawn from the graph. When cognitive functioning is low as indicated by a value of zero on the MMSE, there is aggressive behaviour displayed by nine of 27 residents. Conversely, when cognitive functioning is low, as indicated once again by a value of zero, there are zero frequencies of aggressive behaviour displayed by eight of 27 residents. This finding is consistent with the literature in that up to a point, as cognitive impairment increases so does aggressive behaviour. Eventually, however, cognitive impairment is so severe, as

in later stages of Alzheimer's Disease, that aggressive behaviour is no longer possible. The appearance of competing conclusions may be related to the function of the MMSE as a screening tool for cognitive impairment, rather than as a tool to identify the impaired cognitive domain.

The second cross-sectional hypothesis concerning the inverse relationship between Ward Atmosphere and aggressive behaviour (at time one) was also tested with the Spearman Rank Correlation Coefficient. The results of this analysis are summarized in Table 8 & 9.

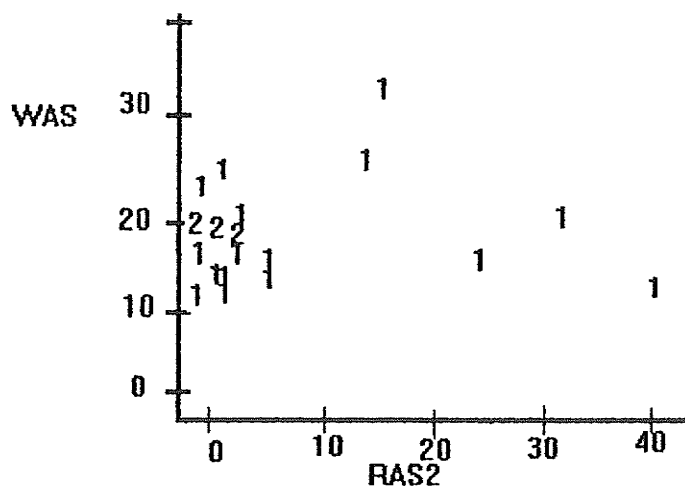
There were three families who chose not complete a WAS leaving only 24 cases in this analysis. Preliminary examination of the mean score of the WAS ratings completed by the seventeen staff ($X = 23$) and the ratings completed by three residents and twenty-one families ($X = 18$). The findings ($r = -.03$; $p > .05$) reject a linear relationship between ward atmosphere and the frequency of aggressive behaviour. The scatterplot confirmed that there was no spatial pattern between the WAS and the frequency of aggressive behaviour. Difficulties in administering the WAS have been described previously, and will be discussed in more detail in the discussion section.

Table 8. Analysis of Correlation of WAS to RAS2.

Spearman's Rank Correlation Coefficient

Correlations:	WAS	RAS2(Time 1)
WAS	1.00	-.03
RAS2 (Time 1)	-.03	1.00
N of cases = 24		p > .05

Table 9. Scatterplot of WAS with RAS2



The correlation of RAS1 to RAS2 at time one was tested using the Spearman Rank Correlation Coefficient. The null hypothesis for this test is that the two variables are independent. With a significant finding ($r = .15$; $p = .001$) a conclusion of independence is rejected. The two measures

of aggression are dependent, that is a high score on RAS1 will result in a high score on RAS2 at time one (see Table 10).

Table 10. Spearman Rank Correlation Coefficient

Correlations:	RAS1	RAS2 (0 ₁)
RAS1	1.00	.15
RAS2	.15	1.00
n = 27	one-tailed p = .01	
	two-tailed p = .001	

A significant relationship between RAS1 and RAS2 is expected as the scales are designed to measure the same phenomenon and contain the same 25 items. The RAS1 uses a Likert type scale to assign the frequency of aggressive behaviour while the RAS2 reports ratio level frequencies of aggressive behaviour. The RAS1 allows a retrospective view of aggressive behaviour over the past six months. The RAS1 was modified to create the RAS2 allowing for concurrent measures of aggressive behaviour. A linear relationship between these two scales indicates that displays of aggressive behaviour in the past six months by individuals in this sample is associated with current displays of aggressive behaviour. A case by case graph of RAS1, RAS2 (at time one), and RAS2 (at time two) is included in Appendix 13.

Socio-demographic variables such as age, gender, diagnosis, length of stay, and medications were also tested for a relationship with aggressive behaviour. The values for the RAS2 (at time one) were converted into two categories, aggressive and non-aggressive, and tested using Chi Square for the categorical values for gender. The value of Chi Square was 3.69 ($p = .055$; Fisher's Exact Test: .07) approached significance. There were five of the seven male participants who fell into the aggressive category, as opposed to six of twenty females.

Spearman's Rank Correlation Coefficient was used to test the relationship between age and aggressive behaviour ($r = -.12$; $p = .54$); length of stay and aggression ($r = -.33$; $p = .10$); and the number of prescription medications and aggression ($r = .30$; $p = .13$) but none of these tests were statistically significant.

The relationship of diagnosis to aggression was not tested statistically. The diagnoses could not be collapsed or combined into meaningful categories and the sample size was too small to allow testing without conversion of the values. The frequencies of each category of diagnosis, reported with other sample characteristics, reveals a high number of residents with Alzheimer's Disease (51.9%) and Dementia (22.2%), consistent with the very low MMSE scores. While 74% of the residents were diagnosed with an organic brain disease, only 41% displayed aggression in any

frequency at pretest. It is difficult to draw specific conclusions about this relationship without further research.

6. Summary

A total of 27 residents, 24 legally responsible persons, and 17 staff members participated in this research. The distribution of values for the MMSE, WAS, RAS1 and RAS2 at pretest and posttest did not meet the assumptions for procedures for non-parametric tests. As a result non-parametric tests were used for analysis.

The reliability for the MMSE, WAS, RAS1 and RAS2 (Time two) as assessed using Cronbach's alpha were acceptable. The reliability for the RAS2 (Time One), reported as .45, was somewhat lower than RAS2 at time two.

The primary hypothesis that aggressive behaviour would decrease following a change in environmental colour was not supported by the findings. However, a change in the frequency of aggressive behaviour from pretest to posttest, either an increase or a decrease, was observed in 44% of the residents. Although not statistically significant, the finding is highly suggestive that changes in frequency of aggressive behaviour occur on an individual basis. Additional factors such as disease stage, learned responses, psychosocial environment, and nursing behaviour may also be

operating as influences on the frequency of aggressive behaviour.

The two cross sectional hypotheses were reported separately. First, the relationship between cognitive functioning and aggressive behaviour was examined using a scatterplot. Spearmans Rank Correlation Coefficient Test for a linear relationship and Chi Square were performed but were not statistically significant. Two competing conclusions can be drawn from the scatterplot of cognitive functioning and aggression, both of which may be correct when the limitations of the MMSE tool are considered.

Second, the tests for association between ward atmosphere and aggressive behaviour were not statistically significant. A scatterplot of the WAS and the RAS2 did not suggest a pattern.

The two measures of aggressive behaviour, RAS1 and RAS2 (at time one) were tested for a relationship using non-parametric tests. Spearman Rank Correlation Coefficient was significant at $p = .001$. This direct association is expected as the scales are parallel forms of the same instrument.

The interpretation of these findings, alternative explanations, limitations of this research are presented in the next chapter. In addition, implications for nursing practice and suggestions for future research will be discussed.

VI. DISCUSSION

The discussion of this research is presented in six sections. In the first section the statement of the problem is restated, along with a summary of the findings, to guide discussion of the findings. A review of the findings in relation to the primary hypothesis, interpretation of these findings, and the limitations is provided next. The third section discusses the findings in relation to the secondary hypotheses, the interpretation of these findings, and the limitations. The fourth section is a discussion of the findings within the context of nursing practice. The fifth section explores future research ideas in relation to aggressive behaviour and the elderly. The final section closes the chapter with conclusions based on this discussion.

1. Summary of Major Findings

The environment provides a context full of essential information needed to make accurate predictions about human behaviour (Moos, 1974). Aggressive behaviour of particular residents compromises not only their own quality of life and care needs but also that of many other frail and dependent residents of nursing homes but also their own. This study attempted to shed some light on the relationship between aggressive behaviour and the environment. The specific

objective was to explore the impact of a change in colour on the frequency of aggressive behaviour of the elderly residents of a nursing home.

On an individual case by case basis, the results are highly suggestive of a relationship between aggressive behaviour and the environment. Individual cases examined separately show a change in frequency of aggressive behaviour from pretest to posttest. Although the relationship was not statistically significant, there is suggestion that multiple factors, such as learned response, cognitive functioning, and nursing behaviours, in addition to the environment, contribute to a potential for aggressive behaviour.

The finding of two competing conclusions between cognitive functioning and aggressive behaviour may be a function of the tool used to measure cognitive functioning. All of the residents in this sample were cognitively impaired and could be separated into two groups: aggressive and non-aggressive. The MMSE as a screening tool is not sensitive enough to differentiate between two types of zero scores: one is an incorrect response to every item on the tool, another is no meaningful response to any item. Other studies have reported relationships between cognitive functioning and aggressive behaviour (Cohen-Mansfield, 1988, Ryden, 1988, Winger, Schirm & Stewart, 1987). The lack of a relationship between the ward atmosphere and aggressive

behaviour was surprising. Additional research to assess this relationship is recommended.

2. Primary Hypothesis

The primary hypothesis states: "The frequency of reported aggressive behaviour in a group of elderly residents who are exposed to a change in the environment (wall colour) will decrease significantly from pretest to posttest".

There were individual changes in frequency of aggressive behaviour from pretest to posttest, but the primary hypothesis was not supported. Although the Wilcoxon Matched-Pairs Signed-Ranks test was not significant, this may be related to the recently developed Ryden Aggression Scale and to the limited variability in aggressive behaviour in this sample. The Conceptual Model for aggressive behaviour of elderly residents of nursing homes suggests that additional factors, such as learned responses, cognitive functioning, and nursing behaviour must be considered along with the environment when attempting to identify the potential for aggressive behaviour. Ryden et al (1991) suggest that learned responses continue into disease states such as cognitive impairment. In addition, not all aggressive behaviour is expressed. This research examined the influence of only one aspect of the model, environment, using longitudinal data. A multivariate design

with statistical controls, and a larger sample size, are necessary to test the entire model, by formulating hypotheses that consider all four factors.

Measures of the frequency of aggressive behaviour before and after the colour change were different for 44% of the residents. The direction of change was not consistent, however, with some individuals showing dramatic decreases and others showing dramatic increases. The statistical tests for differences between the pretest and posttest values were not significant thus not supportive of the primary hypothesis.

The change in colour, as suggested by the design of this study, may be responsible for this change in frequency of aggressive behaviour on an individual basis but alternative explanations must also be considered. As indicated earlier, while there are eight different classes of extraneous variables that pose a threat to the internal validity, four are of major concern: history, maturation, testing effects, and experimental mortality.

History as a threat to internal validity refers to the influence other external events may have had on the dependent variable during the time that elapsed from pretest to posttest. The painting took ten weeks to complete, which was the minimal time for data collection given the constraints of this natural experiment. Examples of external events that could influence the dependent variable

include outbreaks of acute illness;; changes in organization, staff, or unit management; or a number of new admissions to the facility. These possibilities were monitored from pretest to posttest but during the 12 weeks of May 3, 1993 to July 28, 1993 none of these events occurred.

Manitoba is currently in the process of restructuring and reforming the Health Care System within the province. As an example of this reform, there are anticipated large changes to the proportion of costs that residents must pay in order to live in the nursing home. These changes were announced but not implemented during the time of data collection. The projected dramatic increases in rates have raised anxiety and concern among families and spouses of nursing home residents, but contact with families had been completed prior to the announcement of proposed rate changes.

Many of the reform measures have focused on careful examination of labour costs in all departments. Staffing costs in nursing departments often represent more than 60% of a facility's operating budget. There remains questions in relation to staff-resident ratios and the staffing mixes that will be recommended for nursing homes by government, but the actual recommendations have not yet been made public. Anxiety and concern about job security for nurses, particularly professional staff, is widespread throughout

the province. The research was conducted in a facility where there have been no announcements of staffing changes to date. These external events may be influencing the behaviours of residents, families and staff but the impact on the findings is minimized by the lack of direct impact to date of Health Care Reform on the facility.

Maturation refers to the processes, that occur within subjects as a result of the passage of time, that result in the change from pretest to posttest, rather than change from pretest to posttest as a result of the intervention. There were three cases eliminated from the analysis due to the residents experiencing trauma resulting in fractures. The fractures resulted in pain, limited mobility, and a change in medications, all of which could also result in a decrease in the frequency of aggressive behaviours.

The painting took ten weeks. During this time the disease states of the residents living in the nursing home continued to progress. Although some of the differences in frequencies of aggressive behaviour may be due in part to disease progression, knowing that Alzheimer's disease progresses gradually over time, it is unlikely that the ten week period would be long enough for disease progression alone to explain the magnitude of change experienced by some of the residents.

Residents with Alzheimer's Disease progress through three stages over a period of five to ten years. The first

stage of the disease lasts about two to four years and is characterized by recent memory loss and personality changes. The second stage of the disease is progression of the changes that began in the first stage, characterized by further cognitive impairment and drastic mood swings. The third and terminal stage lasts usually one year or less, and is characterized by loss of mobility and the ability to communicate (Barrow, 1989). It is possible that some of the residents who experienced a change in frequency of aggressive behaviour may have progressed to a new stage of disease resulting in an increase in frequency for some residents, and a decrease for others. Such dramatic progression of Alzheimer's Disease is not common and only 51.9% of participants were diagnosed with Alzheimer's Disease. Apart from three unusual incidents of trauma, resulting in fractures, there were no other unusual incidents reported.

The impact of **testing effects** on the findings is open to discussion. The unobtrusive nature of the data collection from pretest to posttest, coupled with the cognitive impairment of the residents, reduces the likelihood that residents were aware of the pretest posttest phases of the research.

The response of staff members from pretest to posttest is important to examine. The changes in frequency of aggressive behaviour from pretest to posttest may reflect a

change in reporting behaviour in the staff. The same procedure was used from pretest to posttest, that is the researcher met with the staff at the end of their shift to collect the information needed to complete the RAS2. The same staff rotation was followed through the seven days of data collection at pretest and at posttest. Ten weeks is longer than the six to eight weeks that were anticipated as necessary to complete the painting.

At posttest, staff had to be reminded about the reason for the researcher's presence at change of shift indicating that most of the staff had forgotten about the project from pretest to posttest. However there were several residents reported to have zero frequencies of aggressive behaviour from pretest to posttest, indicating some level of consistency in reporting by the staff.

Finally, the values for each of the RAS1, pretest RAS2, and posttest RAS2 scores, when graphed, is a straight line for 10 of 27 cases. There are 16 cases where the RAS1 and pretest RAS2 score are similar with a change in the RAS2 posttest and three cases where there is no aggressive behaviour at any time. This mixture of results suggest there may be some testing effect influencing these findings.

Although anticipated, **experimental mortality** was not a threat as all the residents who began the study completed all phases of data collection. One resident was moved to another unit prior to pretest, and the data from three

residents were excluded from analysis, as discussed earlier.

As projected in the methodology chapter selection, instrumentation, regression, and interactions between classes of variables, although considered threats to internal validity, were not issues in this research.

The threats to external validity of interactions of selection and intervention, setting and intervention, and testing and intervention would seem to be minimal. The reactive effect, often referred to as the "Hawthorne Effect", considers how much of the change from pretest to posttest was due to any intervention or change, not just the intervention of interest. The process of changing the wall colour meant that for ten weeks there was disruption in the routine and milieu of the environment. There were painters on the unit, new equipment in the corridors, a change in noise levels, new smells, and perhaps even changes in the bathing routines. This chaotic activity may have produced the changes in frequency of aggression. That is, the change in frequency of aggressive behaviour from pretest to posttest could be due to the change in colour, or they could be induced in response to the disruption and chaos on the unit. If the change is due to the process of change rather than the colour change, a second posttest measure might demonstrate a return to pretest levels of aggression or even lower levels than at pretest.

3. Secondary Hypotheses

This research utilized cross-sectional data to test two secondary hypotheses:

1. There is an inverse relationship between cognitive functioning and aggressive behaviour.
- 2) There is an inverse relationship between positive ward atmosphere and aggressive behaviour.

Findings from Spearman's Rank Correlation Coefficient and Chi-square did not support a relationship between cognitive functioning and aggressive behaviour. The scatterplot of cognitive functioning and aggressive behaviour suggests two competing conclusions. The first is that cognitive impairment is associated with aggressive behaviour. The second is that cognitive impairment is associated with non-aggressive behaviour. This finding is consistent with at least three other studies where the amount of aggressive behaviour appeared to be associated with the degree of cognitive impairment (Cohen-Mansfield, 1988, Ryden, 1988, Winger, Schirm & Stewart, 1987). When the MMSE assigns a value for cognitive impairment of zero, there are still differences in cognitive functioning of individuals. For instance, one score of zero may be obtained with thirty responses, all of which are incorrect. A second score of zero may be the result of an inability to

respond in any meaningful way to any of the MMSE questions and as a result of more advanced disease and physical dependence. The MMSE is an effective screening tool to identify individuals with cognitive impairment who require further assessment and diagnosis. A more discriminating tool may produce clearer definitions of those differences between individuals who score zero on the MMSE.

There were two instances where the data appeared as outliers on the scatterplot. Both individuals MMSE scores, however, are still indicative of global cognitive impairment. The clinical cut-off point for global impairment is considered 24, although some research has set the cut-off at 17 (Folstein et al, 1975). Seventy-four percent of participants in this sample scored four or less on the MMSE, 100% scored below a cutoff of either 24 or 17. In a larger more heterogeneous sample, these two values may not be outliers.

Analysis of cognitive functioning and aggression using Chi-square was consistent with the Spearman Rank Correlation Coefficient, that is there was no significant findings.

There was no relationship between ward atmosphere and aggressive behaviour based on scatterplot, and non-parametric statistical procedures. Completing the WAS presented difficulties for residents (n =3), families(legally responsible persons; n= 24), and staff (n=17). There were sixteen of forty items (40%) on the

scale where 20% or more of respondents were unable to choose true or false ($n = 44$). There were 43.3% of respondents who did not select either true or false (missing) for the item "New treatment approaches are often tried on this ward".

Logically one would expect that if the atmosphere on a unit is supportive and positive, then displays of aggression would be reduced. The difficulty in completing the scale may be related to the scale's development in primarily psychiatric inpatient settings, making the items less representative of atmosphere in a nursing home. It may be that this particular nursing home setting shares different types of information with families and nursing assistants in relation to care plans and treatments such that the information needed to respond to the WAS was not available to respondents.

The WAS was developed to evaluate psychiatric inpatient programs. The instrument has been used by other researchers to:

- 1) evaluate programs before and after changes were made to a particular program,
- 2) evaluate programs and then design ideal programs using the findings as guidelines, and
- 3) compare programs with other programs, both within and outside facilities (Blomhoff et al, 1990, Friis, 1986, Moos, 1974).

For this research, changes to the short form of the WAS included substituting the word "resident" for the word "patient", and substituting two items from the long version for two items on the short version. However, the instrument did not seem to transfer well to this nursing home setting. Participants were assured that completing the form would not affect the care of the resident or their relationship with the facility. Concern that this may not be the case may have contributed to the cautious responses given, or there may be gaps in the information that is provided to residents, families (legally responsible persons) and nursing assistants about specific attributes of the care program. The influence of forced choice, as opposed to progressive ordinal options, must also be considered. Where the respondents felt uncomfortable choosing a response, perhaps a range of responses would have prevented missing data.

The Spearman Rank Correlation Coefficient between the retrospective measure of aggression and the concurrent measure of aggression was significant. This meant that high scores on RAS1 lead to high scores on RAS2 at time one. The value of the use of retrospective measures to measure aggressive behaviour has been debated in the literature, as confidence increases with the use of concurrent measures of behaviour. The RAS1 in its original form reviews an even longer period of one year of previous aggressive behaviour.

The socio-demographics were examined by collapsing frequencies of aggressive behaviour into two categories: aggressive and non-aggressive. A Chi-square test of gender and aggression approached significance. This raises learned responses as a factor for exploration in future research.

Generalizability of Findings

The ability to generalize the results of this research to another unit in the same nursing home or to other residents in another nursing home is limited by a number of factors. The entire sample is globally impaired, based on the cutoff points of 24 or 17 for the MMSE.

The setting for this research is also important to consider. The single entry system for placement in a nursing home in the province still allows some level of flexibility in terms of which applicants are offered vacancies in the facility. The mix of residents in this facility may be a reflection of an unmeasured bias in admission policy. The screening process in this facility may result in an unusually high or unusually low number of aggressive residents. The resulting mix of residents may contribute to an atmosphere that is more or less accepting of expressions of aggressive behaviour.

The location of the facility, in the residential neighbourhood of a suburb, may attract specific applicants with unique characteristics. In addition, the facility is not affiliated with any non-profit service group or

religious organization which may influence the applicant pool from which the facility admits. The findings should be examined within the context and setting.

4. Implications for Nursing Practice

Traditional responses to resident's aggressive behaviour by nursing staff include walking away, talking with the resident, modifying behaviour with psychotropic medication, and using restraints to prevent injury or harm to the resident or others (Beck et al, 1990, Feldt & Ryden, 1992, Ryden, 1992). The Conceptual Model, with further testing, may facilitate a more complete assessment of aggressive behaviour and lead to more creative responses. The model suggests that an evaluation of learned responses, cognitive functioning, the environment, and nursing behaviour will identify those factors in the situation that contribute to a potential for aggression. In this way responses to situations may be anticipated and this will facilitate planning for individual residents.

Creative strategies that might be tried include changing the colours used in the environment. The environment, including psychosocial factors, is a much broader factor that still considers individuals. This research has suggested that for some individuals, colour may influence the frequency of aggressive behaviour and should

be considered when planning strategies of response by nursing staff to aggressive behaviour.

Appropriate changes in colour in environments is not difficult, or expensive, to modify. A careful and critical assessment of the colour used in the environments for elderly residents of nursing homes is reasonable and achievable. Participation and control may be strengthened when residents select the colours used on the walls of their rooms, in the curtains and in the bedspreads. Nightingale in her 1860 publication Notes on Nursing, emphasizes the role of environment in health and healing. In her reference to variety as one of thirteen canons of nursing, Nightingale recommends brilliancy of colour in the objects presented to patients as they are "actual means to recovery" (Nightingale, 1969, p.59).

5. Future Research

The findings of this research raise many interesting questions for future research. The first question which needs to be answered is just how unique are these findings. Would these findings hold true for other samples of elderly residents in other facilities, or are the findings representative of only the residents on this unit? A similar design using multiple sites would provide additional testing. Related questions are how specific is the response in terms of the magnitude of colour change and the selection of colour. For this particular research, the intervention

was a change in wall colour from dark orange and royal blue to off white and blue-green. What if the change were reversed? The answer to this question lies outside the bounds of this research.

The distribution of cognitive functioning and aggressive behaviour of this sample was skewed, that is according to the cutoff scores on the MMSE, the entire sample was cognitively impaired, and most exhibited no aggressive behaviour. Currently data is not available on the characteristics of nursing homes therefore it is not clear how this sample relates to the overall population. A large epidemiological study of residents of nursing homes in terms of mental status and aggressive behaviour would establish the frequency and distribution in the population. With information about how serious this issue is, such findings may stimulate and facilitate development of appropriate programs for cognitively impaired and aggressive elderly.

The Ward Atmosphere Scale has proved to be a useful tool in guiding program change for psychiatric inpatient settings (Friis, 1986, Milne, 1986, Moos, 1974, O'Driscoll & Evans, 1988). However, findings from this research also suggest some difficulty in transferring this instrument to the nursing home setting. Modification of this instrument for specific use in the nursing home setting might produce

the data that could allow for more focused and logical change in care programs to meet the needs of this group.

Finally, further testing of the Conceptual Model as an approach to managing aggressive behaviour in the elderly is necessary. This beginning step examined two of the four factors. The model is complex. Each of the factors needs to be examined individually and collectively. Ultimately a multivariate design, with statistical controls and a large sample size would be needed to test the model more appropriately. Such an endeavour is a lifetime process of theory building.

6. Conclusions

Although the differences in frequency of aggressive behaviour before and after the change in colour were not statistically significant, the findings suggest that for some individuals analysis of the entire context of the aggressive behaviour is needed. The Conceptual Model which identifies learned responses, cognitive functioning, and nursing behaviour in addition to the environment as factors contributing to a potential for aggressive behaviour. The model provides a broader context for identifying and managing aggressive behaviour of elderly residents of nursing homes rather than a purely individually based psycho-social approach. Furthermore, the relationship between cognitive functioning and aggressive behaviour

demonstrated two competing relationships. There is a link with cognitive impairment and aggression and there is also a link between cognitive impairment and non-aggression is consistent with other findings in the literature.

The intervention in this research consisted of changing the environmental colour from a combination of dark orange and royal blue to off-white with blue-green trim. Further research is needed to determine whether or not the observed changes at the individual level are due to the specific change of colour. Changing wall colour is an inexpensive and creative strategy to consider when planning for management of aggressive behaviour.

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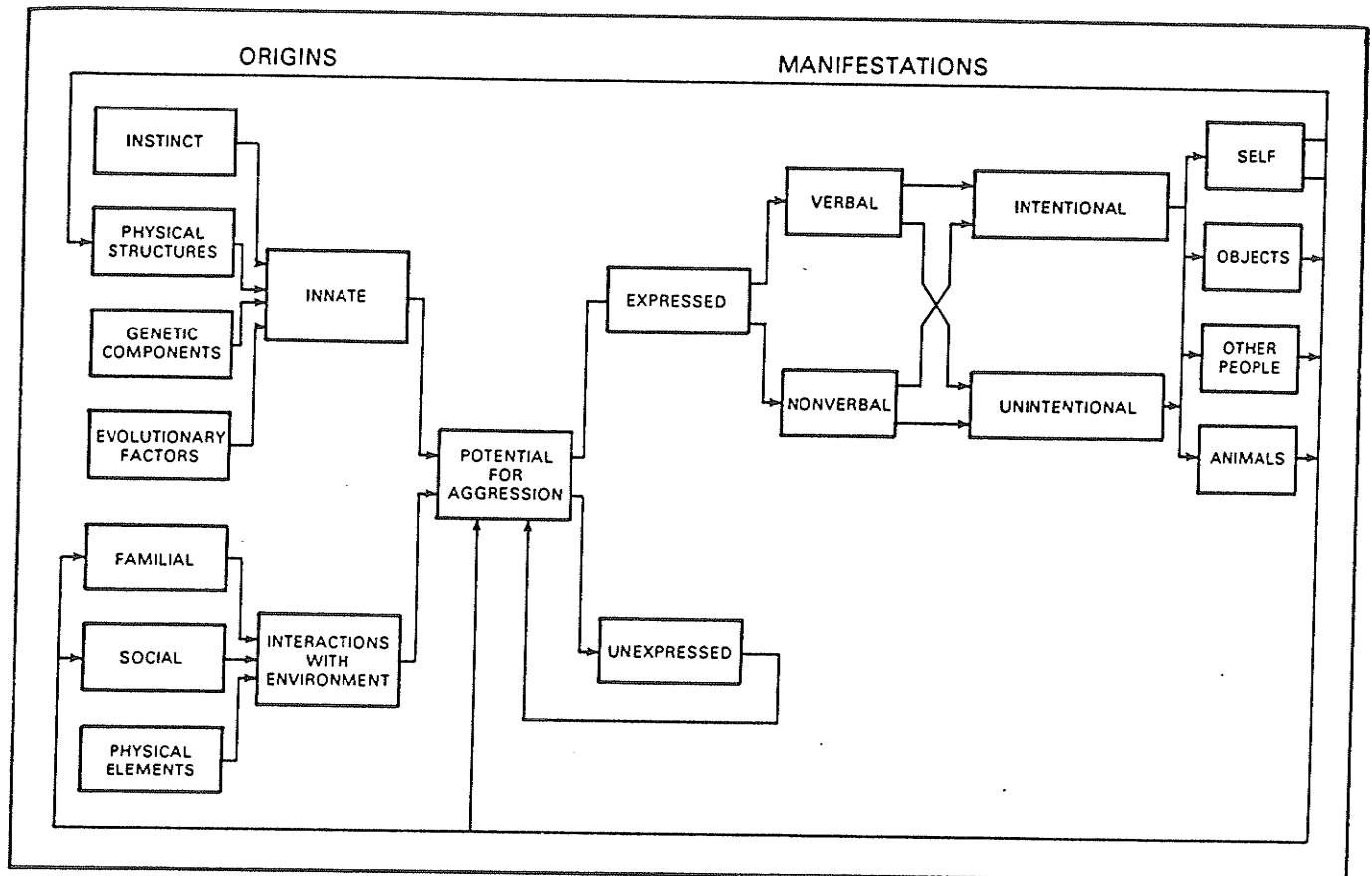
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Appendix 1

A Theoretical Model for Aggression

Source: Lanza, M. (1983) Origins of aggression. Journal of Psychosocial Nursing and Mental Health Services. 21(6), 11-16.

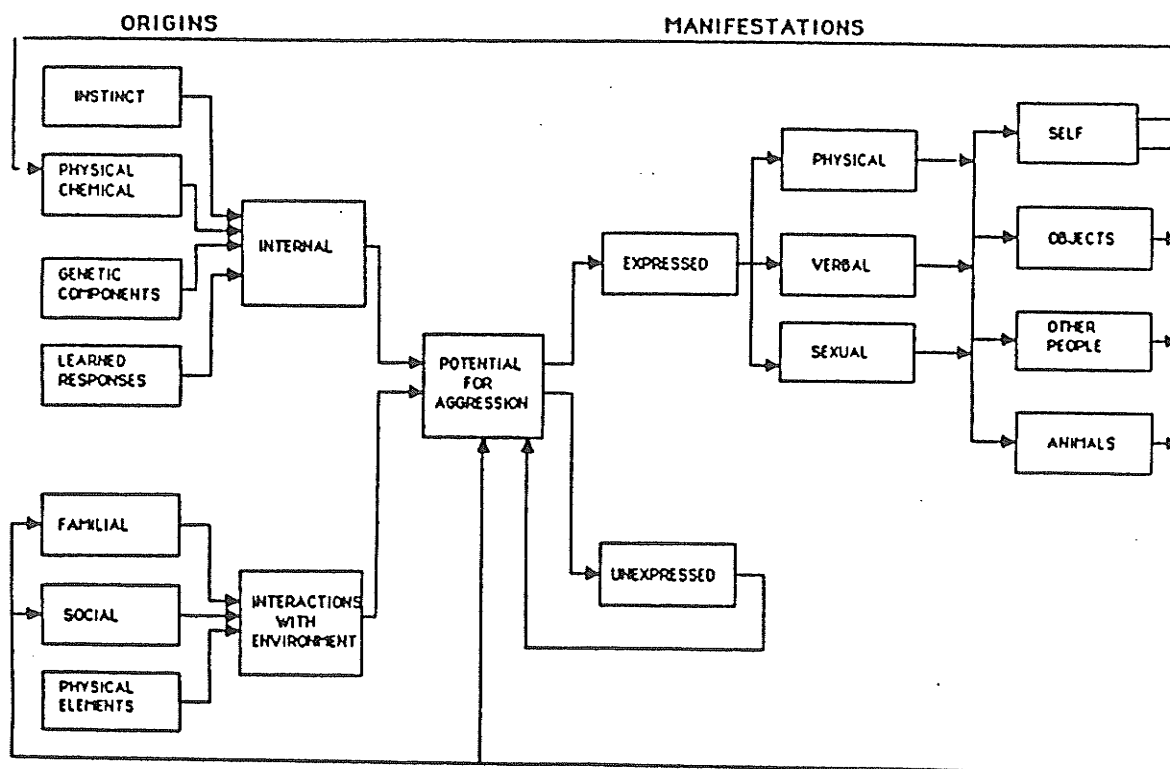


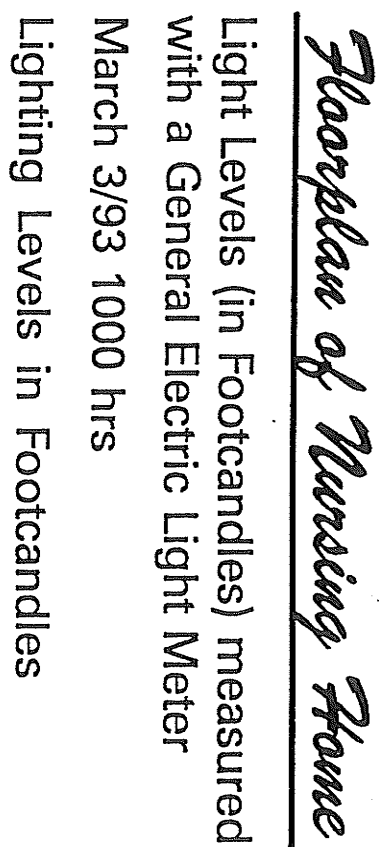
Appendix 2

A Theoretical Model for Aggression in the Cognitively Impaired

Source: Ryden, M. (1988). Aggressive behaviour in persons with dementia who live in the community.

Alzheimer Disease and Associated Disorders, 2(4), 342-355.





Appendix 4

Original Colour: Before Paint Change

Photographs taken with Olympus OM-2 35mm camera (without Flash)



Appendix 5

Ward Atmosphere Scale Subscale Definitions

1. *Involvement* measures how active and energetic patients are in the day-to-day social functioning of the ward, both as members of the ward as a unit and as individuals interacting with other patients. Patient attitudes such as pride in the ward, feeling of group spirit, and general enthusiasm are also assessed.
2. *Support* measures how helpful and supportive patients are toward other patients, how well the staff understand patient needs and are willing to help and encourage patients, and how encouraging and considerate doctors are toward patients.
3. *Spontaneity* measures the extent to which the environment encourages patients to act openly and to express freely their feelings toward other patients and the staff.
4. *Autonomy* assesses how self-sufficient and independent patients are encouraged to be in their personal affairs and in their relationships with staff, how much responsibility and self-direction patients are encouraged to exercise, and the influence on staff of patient suggestions, criticism, and other initiatives.
5. *Practical Orientation* assesses the extent to which the patient's environment orients him toward preparing himself for release from the hospital and for the future. Training for new kinds of jobs, looking to the future, and setting and working toward practical goals are among the matters considered.

6. *Personal Problem Orientation* measures the extent to which patients are encouraged to be concerned with their feelings and problems and to seek to understand them through openly talking to other patients and staff about themselves and their past.

7. *Anger and Aggression* measure the extent to which a patient is allowed and encouraged to argue with patients and staff, to become openly angry, and to display expressions of anger.

8. *Order and Organization* measure the importance of order on the ward in terms of patients (how they look), staff (what they do to encourage order), and the ward itself (how well it is kept); also measures organization, again in terms of patients (do they follow a schedule? do they have carefully planned activities?) and staff (do they keep appointments? do they help patients follow schedules?).

9. *Program Clarity* measures the extent to which the patient knows what to expect in the day-to-day routine of his ward and how explicit the ward rules and procedures are.

10. *Staff Control* measures the necessity for the staff to restrict patients--that is, the strictness of rules and schedules, regulations governing relationships between patient and staff, and measures taken to keep patients under effective controls.

Ward Atmosphere Scale

1. T F Residents put a lot of energy into what they do around here.
2. T F Doctors have very little time to encourage residents.
3. T F Residents tend to hide their feelings from one another.
4. T F The staff act on resident's suggestions.
5. T F New treatment approaches are often tried on this unit.
6. T F Staff strongly encourage residents to talk about their pasts.
7. T F Residents often gripe.
8. T F Residents activities are carefully planned.
9. T F The residents know when the doctors will be on the unit.
- 10.T F The staff very rarely punish residents by restricting them.
- 11.T F This is a lively unit.
- 12.T F The staff know what the residents want.
- 13.T F Residents say anything they want to the staff.
- 14.T F Very few residents have any responsibility on the ward.
- 15.T F There is very little emphasis on making residents more practical.
- 16.T F Residents tell each other about their personal problems.
- 17.T F Residents often criticize or joke about the unit staff.
- 18.T F This is a very well organized unit.
- 19.T F Doctors don't explain what treatment is about to residents.

- 20.T F Residents may interrupt a staff member when they are talking.
- 21.T F The residents are proud of this unit.
- 22.T F Staff go out of their way to help residents.
- 23.T F It is hard to tell how residents are feeling on this unit.
- 24.T F Residents are expected to take leadership on the unit.
- 25.T F Most residents are more concerned with the past than with the future.
- 26.T F Personal problems are openly talked about.
- 27.T F Residents on this unit rarely argue.
- 28.T F The staff make sure that the unit is always neat.
- 29.T F If a residents medicine is changed a nurse or a doctor always tells them why.
- 30.T F Staff don't order the residents around.
- 31.T F There is very little group spirit on this unit.
- 32.T F Nurses have very little time to encourage residents.
- 33.T F Residents are careful about what they say when the staff are around.
- 34.T F Residents here are encouraged to be independent.
- 35.T F Residents are encouraged to learn new ways of doing things.
- 36.T F Residents talk very little about their pasts.
- 37.T F Staff sometimes argue with each other.
- 38.T F Most residents follow a regular schedule each day.
- 39.T F Unit rules are clearly understood by the residents.
- 40.T F If a resident argues with another resident they get into trouble with the staff.

Appendix 6

Resident's Name: _____

Code Number: _____

Ryden Aggression Scale Form 1

Directions: This rating scale is to be completed by the nursing assistant or nurse who is most familiar with the resident being evaluated.

Below is a list of specific behaviours. To the right of each behaviour is a statement about frequency. For each behaviour, **circle** the statement that best describes how often the resident demonstrates this behaviour.

Example: If the resident doubled up his fist without hitting you once or twice every week, you would complete the item as shown below.

KEY: 0- NEVER
 1- 1 TO 3 TIMES A MONTH
 2- 1-6 TIMES A WEEK
 3- 1 OR MORE TIMES DAILY

MAKING THREATENING GESTURES 0 1 2 3

Example: If the resident has never bit you, you would complete the item as shown below.

BITING 0 1 2 3

Please be sure to respond to every item by circling the response that best describes how often the resident demonstrates that particular behaviour.

PHYSICALLY AGGRESSIVE BEHAVIOUR

1. PUSHING/SHOVING	0	1	2	3
2. SLAPPING	0	1	2	3
3. HITTING/PUNCHING	0	1	2	3
4. PINCHING/SQUEEZING	0	1	2	3
5. SCRATCHING	0	1	2	3
6. BITING	0	1	2	3

KEY: 0- NEVER
 1- 1 TO 3 TIMES A MONTH
 2- 1-6 TIMES A WEEK
 3- 1 OR MORE TIMES DAILY

7. SPITTING	0	1	2	3
8. ELBOWING	0	1	2	3
9. KICKING	0	1	2	3
10. TACKLING	0	1	2	3
11. MAKING THREATENING GESTURES	0	1	2	3
12. THROWING AN OBJECT	0	1	2	3
13. STRIKING A PERSON WITH AN OBJECT	0	1	2	3
14. BRANDISHING A WEAPON	0	1	2	3
15. USING A WEAPON	0	1	2	3
16. DAMAGING PROPERTY	0	1	2	3

17. If the resident has shown other physically aggressive behaviour that was not listed above, please describe the behaviour.

HOW OFTEN DOES IT OCCUR? 0 1 2 3

VERBALLY AGGRESSIVE BEHAVIOUR

18. NAME CALLING	0	1	2	3
19. MAKING VERBAL THREATS	0	1	2	3
20. CURSING DIRECTED AT A PERSON	0	1	2	3
21. HOSTILE, ACCUSATORY LANGUAGE DIRECTED AT A PERSON	0	1	2	3

22. If the resident has shown other verbally aggressive behaviour that was not listed above, please describe the behaviour.

HOW OFTEN DOES IT OCCUR? 0 1 2 3

KEY: 0- NEVER
 3- 1 TO 3 TIMES A MONTH
 4- 1-6 TIMES A WEEK
 5- 1 OR MORE TIMES DAILY

SEXUALLY AGGRESSIVE BEHAVIOUR

Many of the following behaviours are ways in which we customarily show love and affection for each other. Such behaviours are considered to be sexually aggressive only if they are against the expressed will and /or despite the resistance of the other person.

If the resident has not acted sexually toward anyone against their will and/or despite their resistance, then circle "0", to indicate never, opposite each behaviour. If the resident has ever done any of the listed behaviours in a sexually aggressive way, then circle the item opposite each behaviour that indicates how often this has happened.

23. KISSING	0	1	2	3
24. HUGGING	0	1	2	3
25. TOUCHING BODY PARTS	0	1	2	3
26. INTERCOURSE	0	1	2	3
27. MAKING OBSCENE GESTURES	0	1	2	3

28. If the resident has shown other sexually aggressive behaviour that was not listed above, please describe the behaviour.

HOW OFTEN DOES IT OCCUR?	0	1	2	3
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**Used with permission:

Source: Muriel Ryden PhD, RN
 Associate Professor

University of Minnesota School of Nursing, Minneapolis, MN.

Appendix 7

Name: _____

Code Number: _____

Ryden Aggression Scale Form 2

(To be completed by the researcher at the end of each shift during change of shift report.)

Record every aggressive behaviour of this resident which occurred from 2400 to 2400 by making a check mark each time the behaviour was observed. Note the details of the incident on description sheet which is on the other side of this page. If there were any consequences of any of the aggressive behaviours, mark this at the bottom of the page. (There is a place to indicate that there was no aggressive behaviour during the 24 hour period.)

Physically Aggressive Behaviours7-3 3-1111-7

language

Biting

Elbowing

Hitting/punching

Kicking

Pinching/squeezing

Pushing/shoving

Pulling Hair

Scratching

Slapping

Spitting

Tackling

Making Threatening

Gestures

Throwing an object

Striking a person

with an object

Brandishing a weapon

Using a Weapon

Aggression toward

property

Damaging property

Verbally Aggressive Behaviours7-33-1111-7

Cursing/obscene/vulgar

Hostile Language

Making verbal threats

Name Calling

Sexually Aggressive Behaviour7-33-1111-7

Hugging

Intercourse

Kissing

Making obscene

gestures

Touching body parts of

of another person

Consequences of Aggressive Behaviour☐ minor damage to objects☐ moderate/severe damage☐ target person felt somewhat threatened☐ target person in pain < 10 minutes, no treatment☐ target person in pain > 10 minutes, no treatment☐ treatment required for injury☐ target person felt extremely threatened☐ visit to physician required☐ absent from work because of injury☐ hospitalized because of injury☐ NO AGGRESSIVE BEHAVIOUR IN PAST 24 HOURS.

Ryden Aggression Scale Form 2 (Page 2)

(To be completed by the researcher at the end of each shift during change of shift report.)

Directions: For each incident of aggressive behaviour checked on the Aggression Scale, record on this sheet a description of the behaviour, noting the time, location, and events leading up to the behaviour and what was done in response to the behaviour. Use the code indicated for the location where the behaviour took place.

Time	Location	Events just prior	Behaviour	Response

Appendix 8
Sociodemographic Data

Name _____

Code Number _____

Date of Birth: _____

Admission Date: _____

Diagnosis: _____

Number of current medications: _____

Appendix 9
MINI-MENTAL STATE EXAMINATION

I would like to ask you some questions to check your memory.
 Most of them will be easy.

1. What is the ... year?
 season?
 date?
 day of the week?
 month?

2. Can you tell me where we are right now?
 For instance what province are we in?
 what city are we in?

3. What are two main streets nearby?
 What floor of the building are we on?
 What is the name of this place?

4. I am going to name three objects. After I have said
 them I want you to repeat them. Remember what they are
 because I am going to ask you to name them again in a few
 minutes. Please repeat the three items for me.. (Repeat
 objects until all are learned)

apple, table, penny

-
5. Can you subtract 7 from 100, and then subtract 7 from
 the answer you get and keep subtracting 7 until I tell you
 stop?

Start now: (93) (86) (79) (72) (65)

-
6. Now I am going to spell a word forwards and I want you
 to spell it backwards. The word is world, W-O-R-L-D. Spell
 world backwards. (Repeat if necessary but not after
 spelling starts)

-
7. Now what were the three objects I asked you to remember?
 (apple, table, penny)

8. *Show wrist watch.* What is this called?

9. *Show pencil.* What is this called?

10. I'd like you to repeat a phrase after me. No ifs, ands,
 or buts. (allow only one trial)

11. Read the words on this page and then do what it says.
Hand "close your eyes" sheet.

12. (*Read full statement and then hand over the paper*) I'm going to give you a piece of paper. When I do, take the paper in your right hand, fold the paper in half with both hands, and put the paper down on your lap.

13. Write any complete sentence on that piece of paper for me.

14. Here is a drawing. Please copy the drawing on the same paper.

Source: Folstein, M., Anthony, J. C., Parhad, I., Duffy, B. & Gruenberg, E. M. (1985). The meaning of cognitive impairment in the elderly. Journal of the American Geriatrics Society, 33:228-235.

Appendix 10
Colour after Painting Complete
Photographs taken with Olympus OM-2 camera (without flash)



Appendix 11**Letter of Invitation to Participate in this Research Project**
Mrs. J. McKenzie

Winnipeg, Manitoba.

R

Date

<< Name >>

<< Address >>

<< Address >>

<< Postal Code >>

Dear << Name >>

I am a Registered Nurse studying at the University of Manitoba in the Masters in Nursing Program. My Thesis work is being supervised by a committee of three professors at the University of Manitoba: Dr. Lorna Guse, Faculty of Nursing, Dr. Cynthia Cameron, Faculty of Nursing, and Professor Grant Marshall, Department of Interior Design. I am requesting your participation in a study I am conducting at Vista Park Lodge. I obtained your name and address from Betty Jane Jones, the Director of Nursing at Vista Park Lodge, as the legally responsible person for << Name of Resident >>. Mrs. Jones (Director of Nursing, Vista Park Lodge) has suggested that I contact you personally to discuss this project.

The project is entitled "Environmental Change in a Personal Care Home" and the purpose of this research is to examine the effect of changes in the physical environment, such as new lighting and new paint, on elderly residents. The project has been approved by the Ethical Review Committee of the University of Manitoba, Faculty of Nursing. The project has also been reviewed and approved by the Administrator, (Jo McKee) and Director of Nursing (Betty Jane Jones) at Vista Park Lodge.

I will be contacting you by telephone to provide additional information, to hear your questions, and to request your participation. If you agree to participate, we can then make an appointment for a 30 minute interview at your convenience. During the interview I will be asking you questions about your family member's health, sociodemographics (your family member's age, for example), and your impression of the atmosphere of the ward. As the legally responsible person for your family member I am also asking for your permission to interview your <<Mother, Father, Trustee>>.

I respect your privacy and your interview will be confidential information. I hope you will consider being interviewed. If you need further information please feel free to contact me at : 254-5965. Thankyou for taking the time to consider this request and I look forward to meeting you in the near future.

Sincerely,

(Mrs.)Jo-Ann McKenzie RN,BScN