

Relationship Between Life Change and
Health in Preschool Children

by

Sandra Louise Summers

A thesis
presented to the University of Manitoba
in partial fulfillment of the
requirements for the degree of
Master of Nursing
in

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SANDRA LOUISE SUMMERS

A thesis submitted to the Faculty of Graduate Studies of
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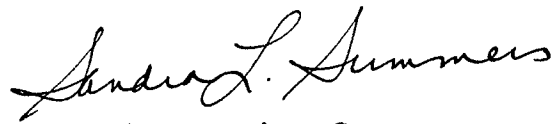
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ABSTRACT

This exploratory descriptive study examined the relationship between life change (life events) and health (development). The convenience sample of 104 four year olds, 52 boys and 52 girls, was accessed through junior kindergarten classes in the Public and Separate School Systems in a Northwestern Ontario city. A supposition based on the work of Holmes and Rahe (1967) was proposed: that life change and health were related, and that an accumulation of stressful life changes frequently had negative effects on health.

A modified version of Coddington's (1972a, 1972b) Life Event Inventory--Preschool was used to measure life change. The Developmental Profile II was utilized to measure health. Demographic and qualitative data were measured on a questionnaire designed for this study. Data were collected from primary caretakers by self-administered questionnaires and interview.

Nonparametric statistics demonstrated no significant relationships at the 0.05 level of significance between life change and health for the total sample; for both sexes; for those in high, medium, or low life change subgroups; for those in different sized families; and for those who had been hospitalized.

Failure to demonstrate this relationship in young children may be due to either methodological and/or substantive considerations. Methodological issues such as the sampling technique, design, instrumentation, and procedure are discussed. However, the substantive question appears to be the most pertinent: do children at this age respond to stress in a manner similar to that of older children or adults? It is premature to identify specific implications for nursing until the questions generated by this study have been further explored.

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INTRODUCTION

In 1979 the Children's Services Division of Ontario's Ministry of Community and Social Services published a paper for discussion of prevention of health problems in children. The author, Dr. Naomi Rae Grant, pointed out that children's health needs are usually attended to only when symptoms of potential problems or illness are evident. She argued for a more comprehensive preventive approach if our society is to provide children with an environment in which they can develop their full potential. She stated that "it should be possible to look at any stage of a child's development and consider what needs to be done to (a) reduce stress and (b) promote health and competence" (p. 2). Dr. Rae Grant's use of the term stress is consistent with the literature which focuses on distress or the individual's inability to adapt (Kagan, 1975, p. 4).

Stress was frequently discussed in terms of high risk populations (Bumbalo & Siemon, 1983, p. 43; Meier, 1973, p. 16; Morris, 1980, pp. 65-66) such as children from low socioeconomic backgrounds (Berlin & Berlin, 1975; Vance, 1977), children from families with disruptive living patterns (Crossman & Adams, 1980), or children from families

with mental illness (Anthony, 1974a; Mednick, & Witkin-Lanoil, 1977). This research demonstrated conflicting results. In some research children exposed to such stressors were found to have an increased risk of developing mental illness (Rolf & Hasazi, 1977), educational failure (Birch & Gussow, 1970), delinquent and criminal behaviours (Rutter & Madge, 1976, p. 162), and/or later marital and parenting problems (pp. 231-236). But in other studies children, who were considered to be at risk, did not develop similar problems (Anthony, 1974b; Burke, 1980; Garmezy, 1974, 1976). Very little is known about the response of children in non-risk populations to similar stressors. Although studies exploring the impact of stress on children are increasing, there are still many gaps in our knowledge as well as considerable difficulties in obtaining sufficient political and financial support to investigate this problem thoroughly (Rae Grant, 1979).

Nursing as a profession has long been committed to promoting health and preventing illness in families; it emphasizes contact with children. Nurses in the community provide both primary and secondary preventive services (Shamansky & Clausen, 1980). Preventive strategies that nurses utilize include providing guidance to families and teachers in modifying stressful environments or in increasing social competence of children and their families

(Siemon, 1978). Nurses also participate in early identification of potential problems in both high risk and healthy populations of children through health assessments, which include developmental screening and history taking (Powell, 1981). Nurses are performing such assessments with increasing frequency to identify those children whose health may be endangered as well as to identify those not usually considered to be at risk. Thus, nurses have a unique opportunity to identify factors that affect the health of children as well as to develop more precise methods of assessing those factors (Barnard, 1980).

Statement of the Problem

Children, like all people, are exposed to changes in their lives (MacKinnon, 1979, p. 3). Whenever a child experiences a change such as parental divorce (Anthony, 1974c; Hetherington, 1979; Kalter & Rembar, 1981; Wallerstein & Kelly, 1979), birth of a sibling (Dunn & Kendrick, 1982; White, 1980), hospitalization (Cormier, 1979; Goslin, 1978; Vernon, Foley & Shulman, 1967), starting school (Murphy, 1974, p. 75), or the death of a loved one (Klerman & Izen, 1977; Sauerman, 1980), adjustment is required.

Chandler (1981) determined that

psychological stress arises from two main conditions: (a) failure of the environment to meet the needs of the individual, or (b) environmental demands. Children commonly experience stress when significant others fail to meet their needs, or when they encounter excessive demands, real or perceived, in their environment (p. 164).

Life changes affecting young children usually originate within the family (Beautrais, Fergusson & Shannon, 1982b; Petros-Barvazian, 1975, p. 454; Toman, 1976). Two types of change may occur: episodic or chronic (Howard, 1983). Episodic crises are temporary separations (Rutter, 1971, p. 255; Sherwen, 1983, p. 3) such as school entry (Bell, 1975) or illness (Aagard, 1979; Graham & George, 1972). Chronic stressors (Birch, 1968; Burke, 1978, p. 6; Rubin, 1976) are emotional deprivation (Haynes, 1979, p. 60; Whitten, 1972), marital discord (Porter & O'Leary), poverty (Berlin, 1975; Blaxter, 1981, p. 1), mental illness (Kopp, 1980), parental alcoholism (Black, 1979; Rydelius, 1981), and permanent or long term separations such as parental death or divorce (Crossman & Adams, 1980; Felner, Ginter, Boike & Cowan, 1981; Felner, Stolberg & Cowen, 1975; Rubin & Price, 1979).

There are significant positive correlations between clustering of life change events and the occurrence of illness in populations of adults (Hinkle & Wolff, 1958; Rahe, 1972a, 1972b) and populations of school-aged children and adolescents (Bedell, Giorani, Amour, Tavormina & Boll,

1977; Heisel, 1972; Palmer, 1981). However, little is known about this relationship for preschool populations.

Coddington (1972b) published Life Event Inventories similar to the Holmes and Rahe (1967) Social Readjustment Rating Scale, but for use with children and adolescents rather than with adults. In one study using Coddington's inventories Heisel, Ream, Raitz, Rappaport and Coddington (1973) identified a positive relationship between life change events and selected diseases in 184 children up to 18 years of age.

In a study of preschool children Paulucci (1977) reported a significant correlation between a cluster of variables which included life change events, health and development, and children's performance on the McCarthy Scales of Children's Abilities. The source of the descriptive indicators for measuring health and development was not identified. Although the findings in relation to health and development were questionable, the study was important for two reasons. First, Paulucci's choice of variables broadened the scope of life event research to encompass a broader definition of health; his predecessors seemed to perceive health simply as the absence of disease. Second, Paulucci's focus on these variables may be more relevant to the younger child than the focus on illnesses, as studied in older populations. The assessment of a child's health and

development may prove to be an appropriate indicator of potential problems, thus providing one means for early intervention and prevention of illness. Paulucci's choice of health and development as variables, as opposed to development of specific diseases, may be a significant shift in life event research. This choice of variables could be of particular relevance to nurses who have been involved historically in promoting the health and development of, and preventing illness in, children (Leavitt, Gofman & Harvin, 1965; Paulus, 1966, p. 659).

Although Murphy and Moriarity (1976, p. 244), in a longitudinal study of children, reported that prolonged stress can have a negative impact on a child's health, Paulucci's life event research utilizing Coddington's inventory was the only study identified that investigated the effect of life events on the health and development of young children. Heisel et al. (1973) found that "children in any patient population experience more significant 'life events' preceding an illness than is thought to be expected in a healthy population" (p. 121). This was found to be true in all age groups studied, including preschool children. Aagaard (1983) and his colleagues collected data using a modified version of Coddington's scale on preschool children as one subset within their sample; they found that an increase in life events were predictive of an increase in

consultation visits, but not of future hospitalization (1982). Coddington (personal communication, May 24, 1983) stated that he had not utilized the preschool scale since 1972 even though he had done several studies utilizing the scales for older populations of children. Life event research with preschool children appears to be in its infancy.

Nursing as a profession has long been committed to promoting health and preventing illness in children. In order to meet this goal, nurses participate in the early identification of potential problems in both healthy and high risk populations (Barnard & Douglas, 1974; Gentry & Paris, 1967). To date, this involves health assessments which include physical examinations, developmental screening, history taking, and anticipatory guidance (Krajicek & Tearney, 1977, p. 31; Walker & Geller, 1977). With an increasing awareness of the effects of rapid social change and its impact on the lives of children (Hinkle, 1974, p. 9; William-Olsson, 1975) and with a growing sensitivity to the implications of a broadening definition of health which could include concepts such as optimal development (Bond & Joffe, 1982, p. viii) and optimal adaptation (Lazarus, 1975, p. 6), nurses recognize their need for more knowledge, skill, and tools to help them meet the health needs of the young child (Barnard, 1980,

p. 210). Early identification of potential problems in children exposed to these social pressures and changes cannot be done without further study. Preliminary studies must be done to determine the relationship between existing tools such as life event inventories and the health of young children. Therefore, this study will investigate the relationship between changes occurring in the lives of preschool children and their health.

REVIEW OF THE LITERATURE

Life Change

A review of the literature showed evidence of an increasing number of investigations which explored the relationship between life change events and disease. These studies were representative of one avenue of stress research which investigated the relationship between the clustering of stressful events in an individual's life and the development of health problems.

Life change researchers share two points of view. First, they focus on a group of stressful experiences called life events "to which everyone is exposed to a greater or lesser extent in the natural course of life" (Dohrenwend & Dohrenwend, 1974, p. 1). Examples of life events include job change, loss of a loved one, marriage, and retirement (Holmes & Rahe, 1967, p. 216). Second, life change researchers share a belief that "stressful life events play a role in the etiology of various somatic and psychiatric disorders" (Dohrenwend & Dohrenwend, p. 1). Life events are measured on quantifiable scales and can be expressed as "life change units" or "LCU's". The primary use of these

scales has been to demonstrate relationships between life events and the occurrence of illnesses (Horowitz, Schaeffer, Hiroto, Wilner & Levin, 1977; Petrich & Holmes, 1977; Rahe & Arthur, 1968; Rahe, Mahan & Arthur, 1970; Rahe, McKean & Arthur, 1967; Rahe, Meyer, Smith, Kjaer & Holmes, 1964).

Historical Perspective

In 1929 Cannon theorized that stressful life events elicit emotional responses which lead to such changes in physiological processes as an increase in adrenaline secretions (1953, pp. vii-xvi; Kagan & Levi, 1975, p. 243). Other researchers have found support for this theory and have extended the research considerably (Frankenhaeuser, 1980; Frankenhaeuser & Johansson, 1975, pp. 46-47; Kagan & Levi, pp. 243-244). For example, the work by Selye (1952, 1956, 1973, 1974) on the physiological response to stress demonstrated that if the stress is chronic, stimulation of the nervous and endocrine systems is sustained leading to potential tissue and muscle damage, finally displaying symptoms of disease.

Meyer (1951) applied Cannon's theory and developed the life chart as a diagnostic tool (pp. 51-57). In commenting on the importance of using Meyer's life chart, Dohrenwend & Dohrenwend (1974) stated that "even the most normal and

necessary life events are potential contributors to the development of a pathological condition" (p. 3). However, in a conference in 1949, practitioners and researchers working with life charts were challenged to go beyond the apparently simplistic approach of looking only at life events and their relationship to diseases. They recommended that the impact of intervening variables such as perception, temperament, and past experience (Dohrenwend & Dohrenwend, 1974, pp. 3-4), be addressed in future investigations.

As stress research and in particular life event research has progressed, the role of intervening variables has been pursued. As a result, some researchers have emphasized perception (Masuda & Homes, 1978), while others have more sharply defined and studied the variables temperament and past experience as coping skills and support systems, respectively. Lazarus, Cohen, Folkman, Kanner and Schaeffer (1980) identified these latter variables as the most significant intervening variables to be investigated in future research.

Selye (1974) found that perception played an important role in the stress response. Cronin-Stubbs and Velsor-Friedrich (1981) indicated that Selye differentiated between positively perceived stressors leading to what he termed "eustress" and negatively perceived stressors leading to "distress". They suggested that eustress did not have

the same destructive effects characteristic of distress but rather was a healthful energy-producing form of stress.

At the same time some life event researchers incorporated the measurement of perception as an intervening variable into their studies while others were outspoken in acknowledging its importance (Houston, Bloom, Burish & Cummings, 1978; Jenkins, 1979; Miller, Bentz, Aponte & Brogan, 1974, p. 268). For example, in their study of 674 Manhattan children and young adults, 11 to 23 years of age, Gersten, Langner, Eisenberg and Orzeck (1974) reported that identifying how a life event was perceived, that is as desirable or undesirable, was productive in determining a relationship between high life event reports and impaired behaviour.

Mechanic (1974a, 1975) also urged life event researchers to move beyond the simple measurement of life change and readjustment to examining the individual's perceptions and reactions to these events. Magnusson and Ekehammar (1975), attempting to further the study of the role of perception in and response to stressful situations, compared how 40 adolescents perceived stressful situations with how the same individuals reacted to those situations. The adolescents they studied differed in how they reacted to demands for achievement even when they perceived the stressful situation in a similar fashion. They concluded

that there was no "general systematic relationship between situation perception data and situation reaction data which is valid across individuals and across situations" (p. 1153).

Studies such as that done by Magnusson and Ekehammar (1975) led Kagan and Levi (1975, pp. 243-244) to report that there was much conflicting data in the investigation of perception. For example, while Gersten and her colleagues (1974) reported that the characteristic of the life event, whether it was pleasant or unpleasant, was important in determining the degree of impaired behaviour in the subjects, Kagan and Levi (1975) cited research that showed that there was little difference in the physiological response. They stated that "psychological stimuli evoking amusement or other pleasant sensation are nearly as potent as those described by the subjects as unpleasant ones in provoking an increased catecholamine excretion" (p. 244). Catecholamines, epinephrine and norepinephrine, are commonly measured as physiological indicators of the stress response (Frain & Valiga, 1979, p. 45; Frankenhaeuser & Johansson, 1975).

Coddington (in press) expressed concern that support systems have not been addressed as a significant intervening variable by life event researchers. He reported that family support behaviours appeared to be predictive of school

behaviour when combined with high life event and aptitude scores. He indicated that he intended to develop measures of social support systems, particularly family supports, in the next stage of his life event research with children and adolescents. Other writers and researchers also encouraged study of support systems as a significant intervening variable between the time of introduction of a stressor and the outcome (Burke & Weir, 1978; Burke, 1978, p. 6; Caplan, 1981; Garrison & Earls, 1983; Nuckolls, Tyroler, Cassel & Kaplan, 1972; Rutter, 1979; Sandler, 1980; Wallerstein & Kelly, 1977). As with perception, research in the area of support systems showed conflicting results. Kurdeck (1981) found that it was difficult to identify which social system in the child's life had the most impact in providing support immediately following parental divorce. In contrast, Wallerstein and Kelly (1980) found that the child's relationship with both parents, is the most important support system in determining the adjustment of the child to the divorce.

Lazarus and his colleagues (1980, p. 91) also discussed the unresolved issue, that of the role of different intervening variables such as perception and support systems, in the study of the relationship between stressful life events and the outcomes of adaptation to these events. They concluded that the literature strongly indicated that

there must be cognitive processes mediating between the first awareness of a stressor, coping behaviours, and the outcomes. However, they also found that little was known about the nature of the link between them.

As though in response to some of these concerns, Rahe (1974) developed a model which diagrammed a pathway between the actual experience of a life change and the outcome, which would be the occurrence of an illness. This model took into account two of the three intervening variables mentioned previously, those of perception and coping skills. In his discussion, he encouraged other life event researchers to develop tools to more specifically identify the impact of these intervening variables. However, he was also quick to point out that life event research should still proceed even though these difficulties have not yet been resolved. He arrived at this conclusion following the study of 2500 naval personnel in 1970 (Rahe, Gunderson & Arthur, 1970). He indicated that although the approach used by life event researchers such as himself was viewed by some to be simplistic, it still had merit. He stated that

there are many intervening variables to be considered between a subject's recent exposure to life change and his perception of body symptoms as well as his possible near-future illness reports Even skipping from subjects' recent LCU to their near-future illness reports . . . , it is impressive that something as simple as a brief questionnaire recording of subjects' recent life changes shows any significant correlation with a criterion as distant and unspectacular as subjects' minor illness reports up to a year later

(1974, p. 84).

He cited several studies where such correlations have been reported (Holmes & Rahe, 1967; Rahe, 1972a, 1972b; Rahe, Gunderson & Arthur, 1970).

From the literature it can be concluded that the role of intervening variables such as perception, individual coping skills and personal support systems are largely unresolved areas. It can also be concluded from the large number of epidemiological studies conducted by Holmes, Rahe and their colleagues, as well as other researchers, that there is a positive correlation between the accumulation of stressful life events and the onset of illness.

Another area of concern to critics of life event research is that the majority of studies have been retrospective in design. This type of design limits the impact of such research in that causal relationships cannot be firmly established (Dohrenwend & Dohrenwend, 1974; Mechanic, 1975). However, more recently, prospective studies demonstrated similar results to those of retrospective design, thus holding promise of the predictive potential of life event research and the Life Event Inventories that have been developed from these studies (Aagaard, 1982; Aagaard, Husfeldt & Husfeldt, 1983; Beautrais et al, 1982b; Coddington, in press; Miller, 1980; Rahe, 1979).

The literature reveals that in spite of criticisms of life event research, it continues to proliferate and to demonstrate important findings. Many studies have been done on adult populations, some of which reported positive correlations between life change unit scores and physical and mental illnesses (Bell, 1977; Jacobs, Spilken & Norman, 1969; Lloyd, 1980a, 1980b; Pesznecker & McNeil, 1975), and some of which showed promise of the predictive potential of Life Event Inventories (Miller, 1980; Rahe, 1979).

Life Change Instruments

Adults

Inspired by Meyer's (1951) life chart and the observations of Hinkle (1955) and Selye (1956) that stress is necessary for living, Holmes, Rahe and their colleagues (1967) developed a Social Readjustment Rating Scale (SRRS) which measured adjustment to both positive and negative life events and a Schedule of Recent Events (SRE) which measured the frequency of life events. Although their uses are restricted to adults and older adolescents, and thus not directly relevant to this study, their development was the precursor to the work done with children and adolescents by Coddington and his colleagues (1972a, 1972b, in press; Heisel et al., 1973).

Social Readjustment Rating Scales have been used to

identify populations with a high probability of contracting stress-related illnesses in a manner that is similar to the use of risk factors in epidemiological studies. Rahe (1979) stated that

subjects' recent life change buildup can be used in an epidemiological fashion to identify populations at high risk for the development of physical and/or mental illness For the majority of physical illnesses (including accidents), and for schizophrenia, the etiological mechanism of recent life change appears to be that of a lowering of bodily resistances to disease entities which an individual is prone to develop through genetic and/or environmental predispositions. Thus, recent life change buildup results in a precipitation of clinical symptoms (p. 9).

This explanation of the physiological response is similar to that put forward by Selye (1952, 1956, 1973) to describe the body's response to stress. The results of research appear to confirm this interpretation of the physiological response to stress (Levi, 1975). In the past, epidemiologists have been successful in isolating subsets of the population which may have unusual difficulties in terms of their physical health in adapting to their environment (Cassell, 1975, p. 537; Rose & Killien, 1983, p. 60; Tjossem, 1976). Similar efforts are recommended by life event researchers for identifying populations at risk of developing stress-related physical and psychosocial illnesses (Bumbalo & Siemon, 1983, p. 43; Burke, 1978; Coddington, 1972a, 1972b; Faber & Reinhardt, 1982; Rahe, 1979, p. 2).

Adolescents and Children

As described earlier, many reports have been published on adult populations using Social Readjustment Rating Scales to measure adjustment to life change. Coddington (1972a), noting that these studies excluded children but recognizing the potential value of the Scales for this age population, developed four separate age-specific questionnaires. His scales, known as Life Event Scales, were developed as a result of research which investigated the "significance of the events that occur in the lives of children" (1972a, p. 8). Through the responses of 243 professional child care workers such as mental health workers, teachers, and pediatricians he was able to assign relative values to each life event on the questionnaire. These values were thought to be equivalent to the average degree of adjustment required by a child experiencing specific life change events. These scores provided an estimated stress score, known as a weighted score, for each event as well as a rank order for the total list of events.

Coddington's Life Event Scales identify life events that differ from those events listed on the adult inventories. However, these events are as stressful, or more so, in children than in adults. Kashani, Hodges, Simonds and Hilderbrand (1981) stated that

children are likely to be especially sensitive to such

life events, in the sense that they are in the process of development; in addition to adjusting to life events in the outside world, they must also adjust to intrinsic developmental, biological, hormonal and other changes within themselves (p. 222).

Coddington's (1972b) second study, involving 3620 children and adolescents as a control group, was designed to construct a life events growth curve. The curve indicated the amount of adjustment "the average child [can] be expected to undergo in the course of a year" (p. 205). Once a growth curve had been identified, Coddington (1972b) theorized that those children at risk for stress-related diseases could be assessed more readily. Although other variables were also investigated such as sex, race, socioeconomic class, and religion, age was found to be the only significant variable.

Investigations

Adolescents and Children

Heisel et al. (1973) examined the relationship between life events, measured by the Life Event Scale, and the onset of illness in a sample of 220 children admitted to a general pediatric service. Five different patient populations were identified: juvenile rheumatoid arthritis, hemophilia, general pediatric problems, surgical needs, and psychiatric problems. Except for the children with hemophilia, two to three times as many children as in the control population of

the previous study (Coddington, 1972b) reported "more frequent and/or more severe life events prior to the onset of their illnesses than did their healthy peers" (p. 121). Children with hemophilia were examined separately because they were found to have fewer life events than the other children; the researchers attributed this to their more restricted way of living to avoid injury and subsequent "bleeds". Those hemophiliacs with the highest life change scores were found to be the "high bleeders".

Two studies (Aagaard, 1982; Aagaard et al. 1983) utilized a modified form of Coddington's Scales. They were both prospective studies of children ranging in age from one to 14 years, and from one to 15 years, respectively. Aagaard followed 201 preschool and 106 school children who had been admitted to hospital to the pediatric department. No relationship was found between high life change scores and readmission to hospital. Aagaard suggested that the short duration of the followup of one year was one explanation for this lack of correlation (p. 90). In the second investigation (Aagaard et al.), 241 preschool and 145 school children, patients of local physicians, were studied. Once again the results demonstrated that high life change scores were not related to later hospital admissions. In addition, they found that the higher life change scores were related to an increase in office visits

to the general practitioners. As a result of this study, the researchers concluded that "greater attention . . . be paid to psychosocial stress as a risk factor for illness in children" (p. 280).

Jacobs and Charles (1980) studied adolescents and children, ranging in age from one to 17 years, who had cancer, using Holmes' and Rahe's adult Social Readjustment Rating Scale to assess stress in families prior to the onset of the diagnosis of the disease. Consistent with the findings of an earlier study by Greene and Miller (1958), these families reported a life change score double that of the control group, most of whom had children with minor illnesses only (p. 15).

Adolescents

Studies of adolescents which utilized Coddington's scales or modifications of them were carried out by Palmer (1981) and Coddington (in press) in two independent studies. In 1981 Palmer asked 91 adolescents to rate life events they found to be stressful. Based on the work of Coddington and his colleagues, and her own findings, she developed a self-report questionnaire. The Palmer Stress Events Inventory was divided into three categories: personal (for example, "having to change a reputation you have made for yourself"); familial (for example, being an "only child"); and social (for example, "having to put up

with people who drink and smoke") (p. 49).

In his study Coddington (in press) also invited adolescents to rate the amount of adjustment necessary to adapt to life events for their age group. He reported a high degree of agreement in the ratings between the various groups of adolescents on a number of variables.

The work of Palmer (1981) and Coddington (in press) extended the list of events considered stressful to adolescents and also provided further studies to enhance reliability and validity of the Life Event Scale.

Schoolage Children

School children have also been studied. Monaghan, Robinson and Dodge (1979) developed a British Life Events Inventory for children six to 11 years of age by adapting Coddington's scale to the British culture. Although Monaghan et al.'s inventory was larger than Coddington's original, the results demonstrated between-rater and cross cultural reliability.

Another investigation using Coddington's scales studied chronically ill children ranging in age from six to 15 years who were at summer camp (Bedell et al., 1977). The children with high change scores were found to have significantly more health problems when at camp than did the children with low life changes scores (p. 240).

Preschool Children

Some studies of preschool children reported the use of Holmes' and Rahe's Social Readjustment Rating Scale or a modification of it to determine a family life event score. For example, high family life event scores have been found to correlate with maternal reports of child rearing problems (Beautrais, Fergusson & Shannon, 1982). Barnard (1980), utilized the Schedule of Recent Events developed by Holmes and Rahe (1967, p. 22) and reported on a study of children and their families, followed from the time of the pregnancy until the children were four years old. The investigation "found significant correlations between the life changes the mother reported and the child's developmental outcomes" (Barnard, 1980, p. 210). Barnard further stated that

our findings are consistent with Holmes' theory that if the organism is challenged by too much demand for change there will be a negative influence on the individual's health status. We found too, . . . that families who reported the highest amount of life changes reported the least amount of available support (p. 210).

The study done by Paulucci (1977) is important to this investigation in that it is the only one identified that has utilized Coddington's scale for preschool children to investigate life events and the health and development of this age population. Paulucci's study, exploratory in nature, investigated the relationship of a number of variables to the ability of the children to perform on the

McCarthy Scales of Children's Abilities. Some of the variables investigated and the methods of data collecting utilized included: life change events of the children--Coddington's Life Event Scale for Preschoolaged Children filled out by the child's mother; life change events of both parents--Holmes' and Rahe's SRRS filled out by each parent; children's temperaments--ranked by the teacher of each class according to a description given by the researcher; children's physical health and development--ranked by the teacher of each class according to a description given by the researcher; anecdotal information about the child and his family--provided by the child's teacher; parental intelligence levels--assessed on the Shipley-Hartford Intelligence Tests; and factors within the home and family of each child--open-ended parent interviews.

The parents were asked to fill out the Holmes and Rahe SRRS for the previous 12 months and in addition to fill out a modified version on certain critical events for the four years of the child's life. The most powerful predictor of the child's ability to perform on the McCarthy Scales was reported to be the father's combined score on the 12 month SRRS and on the four year modified SRRS (p. 95).

Health

Agreement on an acceptable definition of health has become a contentious issue (Patrick, Bush & Chen, 1973; Randall, 1981; Siegel, 1973). The World Health Organization (1946) defined health as "a state of complete physical, mental and social well being and not merely the absence of disease" (p. 100). This definition was once widely acclaimed as a forward-looking perspective on health, an utopian view (Terris, 1975). While it has been criticized widely, it nevertheless led the way for broader definitions of health to emerge.

Currently health is being conceptualized, not as a completed state of being, but rather as a process of adaptation (Dolfman, 1974) which allows the person to pursue life's goals (Hoke, 1968). This concept is well supported in the literature (Ardell, 1977; Dubos, 1965; Dunn, 1959; Hoyman, 1975) and is described in a variety of ways: optimum level of functioning (Archer & Fleshman, 1979); adaptation (Berg, 1975; Goosen & Bush, 1979; Ryden, 1977, p. 72); optimal or positive development (Bond & Joffe, 1982, pp. viii, 1); positive health (Brubaker, 1983; Siegel, 1973); wellness (Bruhn, Cordova, Williams & Fuentes, 1977); high level wellness (Dunn, 1959); wholeness (Kass, 1975); optimum health (Milsum, 1980); and homeostasis or

equilibrium (Hall, 1983, p. 18; Selye, 1979, 1980) to identify but a few.

Dolfman (1974) recognized the impracticality of continuing what he believed was an impossible search for one definition of health which would be acceptable and useful in all settings. He viewed health as a relative concept which varies from one situation to another, from one time to another even in the same situation, and which is closely bound to the values and norms of each given setting. This view of health, as relative, is well documented in the literature (Baranowski, 1981, p. 248; Bruhn et al., 1977; Randall, 1981, p. 3; Siegel, 1973). As an alternative to trying to find one definition of health, Dolfman (1974) recommended the use of an operational model to combat difficulties associated with the relative nature of health (Berg, 1975; Smith, 1981). In identifying how nurses practice, Smith also grappled with the problem of defining health. She described several existing models of health rather than attempting to resolve this thorny dilemma. In order to resolve the problem, Dolfman stated that his model could be made operational in a way that would be unique to each situation. By using his approach, researchers would be able to identify those characteristics or behaviours unique to the situation under study. Such characteristics or behaviours would be representative of one or more of the

three broad and interrelated concepts which Dolfman identified as "fundamental to the implications of health" (p. 207); namely function, adaptation, and normality.

Dolfman (1974) described his model of health as follows:

an individual is healthy . . . if he is functioning adequately in a stated environment; and if while functioning in this environment he is subjected to some sort of stress, he is able to adapt to this stress within the range of normal functioning (p. 207)

and further, he stated that

an individual is not healthy if he is not functioning adequately in a stated environment; or if while functioning in this environment, he is subjected to some sort of stress, he does not adapt within the range of normal functioning (p. 207).

Dolfman's description of his operational model of health is well supported in the literature (Baranowski, 1981; Dubos, 1965; Terris, 1975, p. 1038). Terris recommended an alteration in the definition of the World Health Organization that would read as follows: "Health is a state of physical, mental and social well-being and ability to function, and not merely the absence of illness or infirmity" (p. 1038). His recommendation supported the central notion put forward by Dolfman, that health is related to the individual's ability to function adequately. In Smith's (1981) description of models of health she identified health in what is known as the adaptive model to be "the condition of the organism in which it can engage in

effective interaction with its physical and social environment. The characteristic mode of this interaction is adaptive behaviour" (p. 45). This description offered further support to Dolfman's model which emphasized the notion of adequate functioning as well as the ability to adapt appropriately. From Dolfman's description of his model of health, it is clear that he established two conditions which would be both necessary and sufficient for health: adequate functioning and, when faced with stress, adaptation within a range of normal functioning (p. 209).

Defining health as a process of adaptation sometimes implied a continual striving for a balance that returned the organism to the same point of balance that existed prior to the impact of the stressor (Hall, 1983; Smith, 1981, p. 49). However, other interpretations of health as a process of adaptation imply growth and change (Baltes, Reese & Lipsitt, 1980; Hartup, 1978; Hartup & Lempers, 1973; Hill, 1981; Scott & Oberst, 1980, p. 10). In this latter approach change is ongoing and therefore the process of adaptation is continuous as the individual interacts with the environment (Goosen & Bush, 1979; Lerner & Busch-Rossnagel, 1981, p. 10; Selye, 1952, 1956).

Health then is conceptualized as a dynamic relationship between an individual and the environment with no ideal nor constant state of equilibrium being anticipated. Since

environments continually change, good health will, by necessity, include adequate functioning in that environment and will also be a process of continual and successful adaption to the changing environment (Berg, 1975, p. 4; Dolfman, 1974; Smith, 1981; Terris, 1975).

Development

Development and health are interrelated, yet discrete concepts. Confusion has arisen since the literature frequently used the terms interchangeably as though the presence of the one is necessary for the presence of the other (Hussey, 1983, p. vii; Wilson & Fitzpatrick, 1984, p. 24; Wolf & Goodell, 1976, p. 23).

The literature described the interrelatedness of these concepts. Reed (1983), for example, stated that "human health and functioning are integrally related to developmental phenomena" (p. 18). Dolfman (1974) described one aspect of health in terms of functioning; and Baranowski (1981) described one aspect of development in terms of the capacities necessary for functioning (p. 252). Further support for the interrelatedness of the two concepts is offered by Koster (1983) who pointed out that the "ability to select and practice behaviour that maintains health correlates with the achievement of developmental tasks"

(p. 29). Children who are ill or are hospitalized frequently show signs of slowed development and a loss in ability to perform previously mastered developmental tasks (Goslin, 1978; Wolfer & Visintainer, 1975). Their capacity to function adequately to maintain their health is diminished. A cyclical process begins in which the illness may slow the development of new capacities; then, the lack of necessary capacities to deal with the illness occurs, further prolonging ill health (Field & Bhoyrub, 1979). Thus, under normal circumstances, the ability to achieve developmental tasks (Koster, 1983) emerges from the new capacities of the individual that in themselves developed to aid the individual to function adequately to perform these tasks and to adapt successfully to the environment (Haan, 1977, p. 18). Without the development of new capacities the individual could not "select and practice behaviour that maintain[s] health" (Koster, 1983, p. 29).

The interrelatedness of the two concepts is further demonstrated. Berg (1975) pointed out that "health . . . has to do with coordinated functioning" (p. 14). Coordinated functioning is described by Reed (1983) as organization and integration. The development of new capacities (Koster, 1983) is a result of a transformation in both organization and integration (Reed, 1983) as a result of new patterns of qualitative change that allows for

coordinated functioning or, as Berg stated, health. The process of development, however, is specific for "each level of development and . . . represents the most productive patterning for the given stage" (Reed, p. 23). This allows the individual an enhanced ability to interact with the environment in a more specialized, differentiated, and appropriate manner given the requirements of that stage of development (Keller, 1981; Koknke, Zimmern & Greenidge, 1974, pp. 6-7; Richmond, 1967, p. 653). The individual is thus able to function adequately and to adapt successfully to the environment. According to Dolfman (1974) the individual is a healthy person if the individual is able to meet these requirements. Developmental processes have considerable significance for health (Siegel, 1973; Terris, 1975, pp. 1040-1042).

Implications for Health and Development

According to Dennis and Hassol (1983) there is a link between the appropriateness of development for each age group and "the implications for building and maintaining good health" (p. 17) throughout life. Dolfman (1974) also discussed implications for building and maintaining good health. He identified three broad and interrelated concepts basic to these implications: adaptation, function, and normality (p. 207). These concepts are also basic to the implications of development.

The characteristic of development that pertains to adaptation is the process that increases the individual's capacity for specialized and successful interactions with challenges from the environment (Andreoli & Guillory, 1983, p. 28; Riegel, 1976; White, 1974). The characteristic of development that pertains to function is the development of capacities or patterns of behaviour that facilitate the individual's adaptive responses to the environment (Berg, 1975; Mullen, 1983, pp. 53, 55). The characteristic of development that pertains to normality is the emergence of appropriate capacities which are predictable and sequential patterns (Bigner, 1983, p. 20) and which are specific and appropriate to meet the demands of each developmental stage (Reed, 1983). They should appear within the time frame of established norms. The link between development and normality is suggested by the proliferation of developmental tests that measure different aspects of development. The majority of these tests measure the development of children of different ages. If a child is found to be lagging behind the established norms of peers, the health of the child could be considered to be at risk in terms of developing a disability or illness (Meier, 1973, 1976; Milani-Comparetti & Gidoni, 1967; Powell, 1981). This discussion has demonstrated that the three concepts Dolfman (1974) considered fundamental to the implications of health can

also be considered fundamental to the process of development.

Historical Perspective

Human development theories have been the focus of controversy for many years: maturationism versus environmentalism or nature versus nurture. Repeated attempts of the maturationists have failed to prove that genetic endowment (nature) alone provided the determining factors for developmental change, just as have attempts by environmentalists to prove that environmental factors (nurture) alone are responsible for developmental change. As a result some researchers and theorists have proposed an interactionist perspective (Hartup, 1978; Hartup & Lempers, 1973). This view of development "recognize[d] that both heredity and environment work together to influence developmental change" (Bigner, 1983, p. 18). Other writers recognized that health is also influenced by the interaction between heredity and environment (Berg, 1975; Keller, 1981; Llorens, 1970).

Interactionists interpreted the individual's ability to adapt to the environment as a active process (Chess & Thomas, 1976; Grinker, 1974, p. xiii; Haggard, 1974; Hamburg, Coelho & Adams, 1974, p. 412; Sells, 1963; Zern, 1974). In other words, they perceived individuals to be "producers of their development" (Lerner & Bush-Rossnagel,

1981, p. 1; see also Korner, 1971, p. 617). They have discarded the notions of the maturationists such as Ames, Gillespie, Haines and Ilg (1979) and Gesell and Ilg (1943) who perceived individuals, to a greater or lesser degree, as "preprogrammed machines with a fixed developmental plan" (Bond, 1982, p. 10). They have also abandoned the ideas of the environmentalists who perceived the individual as only passively waiting to be shaped by the environment (Bond, 1982). In support of the perspective of the interactionists, Bond drew attention to the incredible capacity of the newborn to relate to the environment. She stated that not only is the newborn able to "perceive, process, and respond to the environment" (p. 9) but is capable of affecting it.

One belief held in common among all three schools of developmental thought and, in fact, also among most developmental theorists, is that young children ought to be the focus of study. Childhood was not only perceived to be a time of life when the individual may be at greatest risk in terms of health and development, but it was also perceived as a time when the foundations for later health and development are laid down (Cohen, 1974; Eddy, St. Pierre & Alles, 1982, p. 559; Matthews, 1979, 1981; Rosa, 1975; Rutter, 1970; Schaeffer & Bayley, 1963).

Consistent with these beliefs concerning the

significance of childhood to health and development is the increasing emphasis being placed on prevention (Baric, 1969, p. 24; Bolman, 1967, p. 8; Eisenberg, 1981, p.4; Milio, 1976; Nowlis, 1981; Ruffing, 1979, pp. 234-236). Cox, Sullivan and Roghmann (1984) stated that "prevention is unequivocally the most fundamental and effective health care intervention" (p. 168). Secondary prevention and early identification of potential problems is well documented in the literature as the most frequently utilized level of prevention (Eisenberg, 1981, p. 15; Freud, 1965; Green, 1979, pp. 56, 58; Hall & Sheedy, 1980, p. 15; Oppenheimer, 1965; Pender, 1975). The belief supporting this activity is that potential problems should be identified as early as possible so that appropriate action can be taken thus preventing the illness from occurring or to detect it before signs and symptoms appear (Capute & Biehl, 1973; Westman, Rice & Bermann, 1967, pp. 725, 727). Tableman (1981) stated that "prevention efforts rest on the expectation that adaptive skill and the environments (families, school, support systems) can be changed" (p. 38).

There is an increase in the amount and degree of stress in children's environments (Lancaster, 1981; McConville, 1982, p. 4), thus there is potential for a concomitant increase in stress-related problems either during childhood itself or in later life (Coleman, 1978, pp. 56, 63-64;

Lancaster, 1981). Tableman (1981) stated that "children are in situations which have the potential for generating stress and creating deficits in physical and emotional resources over an extended period Children at risk, thus, . . . are likely to experience continuing stress and deprivation" (p. 38). Yates (1983) explained that "resistance to physical or psychic stress decreases when the organism can no longer effect a biological and/or emotional adjustment to changes in the environment" (p. 131). Therefore, early identification of children who may be at such risk is mandatory if individuals are to have the opportunity to develop fully (Beck, 1982, p. 21; Rae Grant, 1979, p. ii).

Health assessment is one method of identifying children at risk (Barnard & Douglas, 1974; Goodman & Sours, 1967; Haynes, 1979; Powell, 1981). Assessments may focus on physical, mental, emotional, and social health through the use of physical examination (Frankenburg, 1973, pp. 149-162; Korsch, Negreti, Mercer & Freeman, 1971; Nellhaus, 1976; Paine, 1969; Waldrop, Pedersen & Bell, 1968); developmental testing (Adair, 1977; Bruner, 1970; Frankenburg & Camp, 1975; Knobloch & Pasamanick, 1974; Sapir & Wilson, 1963; Thorpe & Werner, 1974); behaviour and/or temperament assessment (Allan, 1976; Barron & Earls, 1982; Campbell, 1979; Chess, 1966; Earls, 1981; Earls & Richman, 1980;

McDevitt & Carey, 1981); history taking (Gordon, 1976; Hart, Bax & Jenkins, 1978); and/or a number of other investigative or diagnostic tests (Barnard & Douglas, 1974; Frankenburg & Camp, 1975; Northern & Downs, 1974). Those involved in such preventive activities recommend preliminary screening of large target populations prior to conducting intensive health assessments (Frankenburg & Camp, 1975). This would facilitate expedient identification of groups at greatest risk.

Developmental Instruments

There are a large number of tools available for screening the development of children. Several criteria were applied when searching for an appropriate measurement of children's development for this study. According to Frankenburg and Camp (1975) and Meier (1973), many instruments were restrictive in that they only measured one or two aspects of development, some of them required highly specialized professionals to administer and/or interpret them, and some of them were too time consuming to suit the requirements for screening large populations. The selected instrument must avoid these difficulties. In addition, the literature supported the use of a broad, multidimensional approach (Barnard & Douglas, 1974; Belleville, 1972). Thus, any tool selected should be capable of assessing several areas of development. Another

requirement for this study was that the tool should have quantitative capability for the purpose of comparing results against a predetermined standard or norm. A further criterion was that the instrument should be designed for use with normal children as well as with those who are advanced or delayed. The instrument should be sufficiently sensitive to developmental delays within as specific a time frame as possible (i.e., six to 12 months). It must also be capable of assessing an age range considerably younger as well as beyond the age of the children being studied (i.e., two to six years of age at least). This would allow for measurement of children who may be either advanced or delayed in their development but are approximately the same chronological age. Finally, because of the difficulty in assessing young children, it would be preferred if the mother or a knowledgeable caretaker were able to provide the data rather than directly testing the child.

A large number of instruments were reviewed. Several were directed at inappropriate age groups and/or designed to deal with too specific an area of development. For example, for newborns through infancy the following instruments were identified: Carey Infant Temperament Questionnaire (Haynes, 1979, p. 81), Cattell Infant Intelligence Scale (Haynes, p.74), Griffiths Mental Development Scale (Haynes, p. 74), Milani-Comparetti Developmental Screening Test (Haynes,

p. 77; Milani-Comparetti & Gidoni, 1967), Neonatal Perception Inventory (Haynes, p. 80), Developmental Approach Test (Krajicek & Tearney, 1977, p. 43), and Neonatal Behavioural Assessment Scale or Brazelton (Krajicek & Tearney, p. 43). For children up to three years of age the following tests were identified: Composite Development Inventory (Haynes, p. 74) and Haynes Guide to Normal Development.

There were even more tests for the preschool child; however, most of them were designed to identify only one or two aspects of development. The legislating of a program in the United States known as the Early and Periodic Screening, Diagnostic and Treatment (EPSDT) program in 1967 initiated the development of many instruments to assess children's development including the one selected for this study (Alpern, Bell & Shearer, 1980, preface; Doeff, 1981, p. 43; Keller, 1983, p. 110). Even though this program was directed toward low income children, Thorpe and Werner (1974) observed that "middle class families are requesting similar health services" prior to the enrollment of their children in school (p. 362).

In a comprehensive review of developmental instruments, Haynes (1979, pp. 79-83) identified the following measures appropriate for the preschool child: Alpern-Boll Developmental Profile, Boyd Development Progress

Scale; Denver Articulation (DASE), Denver Audiometric (DAST), Denver Eye (DEST) Screening Tests; Denver Prescreening Developmental Questionnaire (see also, Frankenburg, van Doornick, Liddell & Dick, 1976); Denver Developmental Screening Test (DDST); and EPSDT. Other writers identified alternative tests such as the Behaviour Problem Checklist (Achenbach, 1979; Quay, 1977); Preschool Behaviour Rating Scale (Barker & Doeff, 1980); Caldwell Home Inventory (Bradley & Caldwell, 1977, 1979, 1981, 1984); The Preschool Attainment Record (Frankenburg & Camp, 1975, pp. 418-421); Functional Scale (Garfield & Shakespeare, 1964); Minnesota Child Development (Garrity & Servos, 1978); Child Development Record (Gentry & Paris, 1967); Gesell's Developmental Schedules (Gesell et al., 1940; Gesell & Ilg, 1943, 1949); Behavioural Development Profile, Boyd Development Progress Scale, Cooperative Preschool Inventory (CPI), McCarthy Scales of Children's Abilities (Krajicek & Tearney, 1977, pp. 42-43); Washington Guide to Promoting Development in the Young Child (Paulus, 1966); Riley Preschool Development Screening Inventory (1969); and Head Start Developmental Screening (HSDS), School Readiness Survey (SRS), Thorpe Developmental Inventory (TDI) (Thorpe & Werner, 1974).

The Denver Developmental Screening Test (DDST) was the most frequently cited instrument in the writings of and



studies of both its developers, namely Frankenburg and his colleagues (Frankenburg, Camp, von Natta & Demersseman, 1971; Frankenburg, Dick & Carland, 1975; Frankenburg & Dodds, 1967; Frankenburg, Goldstein & Camp, 1971) and other writers and users (Dower, 1982, p. 23; Fellowes, Hytten, Billewicz & Thomson, 1979; Medenwald, Price & Zink, 1978; Raynor, 1973). Although popular, the DDST has two major limitations that disqualified it for use in this study. First, it was standardized on a population unrepresentative of the general population; that is, there were few low income or minority children in the sample (Meier, 1976, p. 148). Second, it cannot be quantitatively scored (Raynor, 1973; Fellowes et al., 1979). Even though Fellowes et al. (1979) developed a scoring system for their study and Raynor developed another one as part of her Masters thesis at the University of Washington, I decided not to use the DDST. There was no evidence that either scoring system had been identified elsewhere in the literature or by the originators of the DDST.

The only instrument which met most of the criteria and was the least restrictive instrument, was the Developmental Profile II (Alpern et al., 1980). It was reported to measure "children's development without bias to sex, race or social class . . . [and] consists of five skill areas which identify the age level at which the child is functioning in

the Physical, Self-Help, Social, Academic and Communication areas" (p. 36). It can be administered, scored, and interpreted by persons without formal training in psychometric testing and can be administered in 20 to 40 minutes. The Developmental Profile is capable of quantitative scoring. It was standardized against a population of normal children and also has been utilized with children who were either advanced or delayed. Through intensive item analysis it has proven to be sensitive to developmental delays that might occur in a six month period when development is most rapid, between the ages of birth to 4 1/2 years; and in a 12 month period from 4 1/2 to 9 1/2 years. Finally, it is designed so that it may be administered through interviews with a person who knows the child well, such as the child's mother (Alpern et al., 1980, p. 37; Boll & Alpern, 1975; Burke, 1978, 1980). Further information regarding the Developmental Profile will be provided in the chapter on Methodology.

Summary

Life event research has a long history and is one component of the field of stress research. There continues to be methodological problems which include both the role of intervening variables between the stressful event and the

outcome, and the prolific number of retrospective studies that limit the predictive power of such research. Nevertheless, the value of pursuing this type of research has been clearly identified, particularly in light of more recent prospective studies which are demonstrating similar associations as previous investigations.

Adult populations have been the most frequently studied: there were relationships between high life event scores and a multitude of specific illnesses. There were similar results for adolescents and school children. However, by comparison, there were very few studies with preschool children. This is surprising since the Social Readjustment Rating Scales of Holmes and Rahe and the Life Event Scales of Coddington are potentially useful in identifying high risk populations. This is one aspect of secondary prevention known as early identification. An assumption behind all preventive action is that the earlier an unhealthy process can be identified, the better the chances are of preventing further difficulties. The literature related to child health and development clearly demonstrated the importance of the early years of life to later health and development. Therefore, it seemed appropriate to examine the relationship of life event scores to processes of early childhood. Although feasible to study young children in the same manner as older populations, that

is to look for relationships between high life event scores and specific diseases, it seems more appropriate to look at the child's health as measured by developmental assessment, which is a frequently assessed aspect of a child's health status and which may be a more meaningful indicator in this age group than are specific diseases. Childhood is plagued by a multitude of age-specific illnesses as well as many communicable diseases. The pursuit of that avenue could be an endless search for the proverbial "needle in a haystack". A child's development however, has an important and lasting impact on a child's life.

Furthermore, nursing, historically, has been interested and active in the promotion of health and the prevention of illness in young children. With the multitude of added stressors identified as impacting upon the lives of young children, and with the limitation of current tools to assist nurses in early identification of children with potential problems, this avenue of research is necessary.

Therefore, in light of the current status of life event research and the potential of the scales utilized by life event researchers to be predictive of later health outcomes, I investigated the relationship between cumulative life events and the health and development of young children. This was done utilizing instruments with potential value for future screening.

Conceptual Framework

The conceptual framework incorporates two broad concepts: life change and health. These two concepts were examined in terms of the young child.

Life change is experienced by all individuals. It is reflected in the cumulation of life events that occur within a given period of time. Events in the life of a preschool child could include entry to school, parental divorce, or birth of a sibling. Some of these events are expected in the normal growth and development of children. However, some children are exposed to more change in a short period of time than others. There is growing evidence of a positive association between a clustering of life changes and negative health outcomes.

Health is a process of adequate functioning and successful adaptation to the environment, and is perceived as a dynamic interaction between the child and the environment.

Health and development are identified as interrelated but discrete concepts. The presence of one is perceived as necessary for the presence of the other.

Individual development is also a process of dynamic interaction between the child and the environment. Indicators of development are frequently utilized as

measures of child health.

There is evidence that child development is related to life change.

This study examined whether or not there is a relationship between the young child's health and life change. The variables chosen to represent health and life change are development and life events, respectively.

Purpose

The purpose of this exploratory descriptive study is to determine the relationship between life change and the health of young children.

Research Question

What is the relationship between life change and the health of young children?

Definitions

Conceptual

Life Change

Life change is defined as any event in the life of an individual that has the potential to alter the normal

functioning and behaviour of that individual regardless of its desirability, and that calls upon the individual to adapt (adapted from Gersten et al., 1974, p. 159).

Health

Health is defined as the process that allows an individual to function adequately in a stated environment. If, while functioning in the environment, the healthy individual is subjected to life change, that individual is able to adapt to this change within the range of normal functioning (adapted from Dolfman, 1974, p. 207).

Operational

Life Change/Life Events

For this study life change is defined as any life event that occurs in the twelve months prior to testing a child requiring the child to adapt to it. Only life events listed on or similar to those on a modified version of Coddington's Life Event Inventory for Preschool Children will be measured. Life events will be measured by this instrument.

Health/Development

For this study health is defined as the ability of the child to function in five developmental areas: physical, self-help, social, academic, and communication

within the stated norms of the Developmental Profile II (Alpern et al., 1980). Development will be measured by this instrument.

Assumptions

For the purpose of this study these assumptions were adopted.

1. Life events require the individual to adapt regardless of the desirability of the events.
2. Individuals interact with the environment in a reciprocal fashion. While the environment will influence the individual, so will the individual influence the environment.
3. The force within the child's environment which will have the most influence on the child is the child's family.
4. The child can exert an influence on the family environment.
5. Development is a valid indicator of child health.
6. The child's ability to function adequately and to adapt to change in the environment will be reflected in developmental outcomes.

METHODOLOGY

Design

The literature review indicated that the current status of life event research with young children is at a formative stage of development. Therefore, the design of this study was exploratory-descriptive. Quantitative and qualitative data were collected utilizing two existing instruments and a demographic questionnaire developed for this investigation. Relationships between life change and the health of preschool children were examined. The purpose was to explore and describe children's interaction with changes in their environment in terms of health outcomes. Although few causal relationships can be inferred from this design, hypotheses may be generated from this preliminary study which can be tested in future investigations.

Setting

This investigation took place in Thunder Bay, Ontario. Statistics Canada reported Thunder Bay had a population of 112,486 in the 1981 census, making it the largest city in

Northwestern Ontario. Thunder Bay had the following socioeconomic conditions: the average income was somewhat higher than provincial or national averages; unemployment rates tended to be a little lower than the national and somewhat higher than the provincial rates; interestingly, the average expenditure for shelter was less than either the provincial or national averages. However, more money was spent on transportation and food than in other major cities such as Toronto (Lakehead, 1980, p. 48). A 1980 study by the Lakehead Social Planning Council indicated that Thunder Bay was identified as a city whose residents enjoyed a "medium" income status compared with the rest of the province and the country. This study also found that there was less disparity between high and low income rates in Thunder Bay than in 15 other Canadian cities of similar size or larger (p. 49).

However, Thunder Bay did show some variability from the rest of the province and the country in terms of its ethnic distribution. For example, there were considerably higher ratios of individuals of Italian, Ukrainian, Scandinavian, and Native Canadian origin.

Sample

One hundred and four (four from the pilot study), four

year olds were selected for this study. This age was chosen for several reasons. First, four is an age at which children are either preparing to enter or have just started attending school. The 1982 Ontario Immunization of School Pupils Act forces the child and the child's family to have contact with the health care system for immunization. This provides an opportunity for health assessments (Barnard & Douglas, 1974, p. 20; Frankenburg & Camp, 1975, p. 399; Morris, 1980, p. 73) to be done on children. Second, this is a time in a child's life "when important developmental and functional landmarks are being reached" (Paulus, 1966, p. 660) in many areas such as psychomotor, social, and language skill development (Doeff, 1981, p. 45; Thorpe & Werner, 1974, p. 362). Additional changes in the child's life may place the child's health at risk (Barnard & Douglas, 1974; Goslin, 1978, p. 341; Yates, 1983, p. 133). Third, much has been theorized about four year olds but little has been firmly established in the area under study through systematic investigations (Brown, 1972, p. 1317; Garrity & Servos, 1978, p. 288; Rosa, 1975, p. 473; William-Olsson, 1975, p. 108). Fourth, investigators have concluded that findings from developmental assessments have more predictive validity as the child reaches this age than at an earlier stage of development (Oppenheimer, 1965, p. 846). Therefore, this age is widely accepted as a valid

time for early identification of problems which, if left undetected, may later become more serious and/or more difficult to reverse (Cravioto, DeLicardie & Birch, 1966, p. 320; Rubin & Price, 1979, p. 553).

By four years of age children in Thunder Bay are found in a variety of settings: separate school system junior kindergarten (approximately 550); public school system junior kindergarten (approximately 780); city-run day nurseries (approximately 70, many of whom also attend junior kindergarten); private nursery school and day care centres (approximately 20); a "laboratory" nursery school affiliated with the Community College (approximately 10); or in private homes with a parent or other caretaker.

All of the children in this population could not be studied, due to the limitations of time, resources, and lack of funding for this study. Lists of children's names were not available to the investigator through separate and public school systems because of their ethical obligations to protect the privacy of the children and their families (Support Staff, both Boards of Education, personal communication, August 1, 1984). Therefore, obtaining a random sample even from the largest subsections of the target population of four year olds, that is those who attend junior kindergarten, was not feasible. As a result, a non-probability convenience sample (Polit & Hungler, 1978,

p. 454) was utilized through voluntary participation of parents contacted through the Separate and Public School Systems. The method has been criticized in the literature because findings can only be generalized with considerable caution; nevertheless, non-probability convenience samples were identified as the most frequent method of sampling human subjects (Kerlinger, 1973, p. 129; Polit & Hungler, pp. 454-458).

Based on the 1982 enumeration figures for Thunder Bay, there were 1,356 children (739 males and 617 females) born in 1980 and still living in Thunder Bay (L. Anderson, Assessment Office, personal communication, July 31, 1984). A sample size of 104, four of whom were from the pilot study, of the accessible target population (1330 in junior kindergarten) was used. This was an arbitrary number but provided a good sample size to estimate the trend of the data. At the beginning of the study, sample variances were not available; it was not possible to use sample size estimate equations such as those used for studies with experimental designs (Snedecor & Cochran, 1967).

Mothers or primary caretakers were interviewed, rather than their children. This approach was justified from several accounts. First, evidence from both the literature and clinical practice indicated that children at this age are not always responsive to direct testing by a stranger

(Thorpe & Werner, 1974; Yarrow, 1960). Thorpe and Werner pointed out that "it takes time and patience to overcome shyness, distractibility and negativeness which are normal behavioural characteristics of this age range" (p. 368).

Second, the literature supported the reliability of parents and mothers as reporters concerning their children. For example, Yarrow (1960) found that a majority of researchers indicated that interviewing mothers was more productive than interviewing their preschoolers. Barnard and Douglas (1974) surveyed the literature dealing with the accuracy of perception by parents of the behaviour of their children. They concluded that parents were reliable as reporters under most circumstances even though "they may tend to underestimate the degree of the problem, and overestimate the child's ability" (p. 81). In a study of children older than those investigated in this study--children from 6 to 16 years--there was an 80% average agreement in psychiatric interviews between children and their mothers when they were interviewed separately (Herjanic, Herjanic, Brown & Wheatt, 1975). Finally, Capute and Biehl (1973) found that interviewing parents was "the most efficient screening strategy when looking for developmental deviation" (p. 25).

The third reason for interviewing mothers rather than testing the children directly was that all instruments

utilized in this study were designed to be administered to an adult who knew the child well, that is a parent or primary caretaker. For example, in testing one instrument to be used in this study, the Developmental Profile, Boll and Alpern (1975) found an 84% overall agreement between the performance of children and parents' estimate of the children's performance (p. 26). Further, in determining the validity of items on the Developmental Profile II, Alpern et al. (1980) found that mothers were very reliable as reporters of the development of their children when they were interviewed concurrently with the child being tested directly, but in separate rooms (pp. 5,33). In regard to the Life Event Scale, Coddington, recognizing the difficulties in gaining accurate psychosocial data from preschool children, designed the Life Event Scale for this age group so that it could be administered to a significant other adult on behalf of the child. Finally, the instrument used to collect demographic data was designed for adult self-administration. Therefore, there was considerable support for the use of mothers or primary caretakers as reporters of the development of their children. All instruments were administered to the child's mother or primary caretaker.

Criteria for Sample

Participants selected for this study met certain criteria. First, the birthdates of the children fell between January 1 and December 31, 1980. The children were eligible to enter senior kindergarten in September 1985, the time when most children born in 1980 would be expected to begin school. Second, the parent or primary caretaker had a good command of the English language, that is, was able to speak English (due to budget limitations, hiring of interviewers capable in other languages was not feasible). Third, the parent or primary caretaker volunteered to participate in the study.

Selection

A letter introducing the study was distributed by the junior kindergarten teachers to be taken home by the children. Of the total 104 subjects, the sample of 100 was selected from those who responded by returning a signed informal consent to the teacher (see Appendix A).

Instruments

Three instruments were utilized (see Appendix B), two of which were self-administered and one of which was completed by the interviewer by questioning the primary caretaker. The two self-administered questionnaires were filled in initially with the Life Event Inventory being first and the Background Information section following. Then the interviewer asked the respondent questions utilizing the Developmental Profile II. The Life Event Scale was administered first to immediately interest the respondents in the interview. The Developmental Profile was left until last to allow for a more relaxed atmosphere between the interviewer and respondent with the more structured part of the interview being completed first.

Life Event Inventory--Preschool

A modification of the preschool scale developed by Coddington (1972a, 1972b, 1983; Paulucci, 1977) was utilized for this study. Coddington extended the work of Holmes and Rahe by attempting "the systematic measurement of environmental stress in children" (Coddington, in press, p. 2). After selecting several events identified in the literature as occurrences in the lives of children he determined the relative amount of adjustment required by a

child for each event. He utilized the event "birth of a sibling", giving it an arbitrary value of 500, against which all other events were to be measured by the 243 participants in the study (Coddington, 1972a, p. 8). Quantifiable numbers were assigned by the participants to each event based on their individual experience with children. They were advised to assign a value that would be equivalent to the average amount of adjustment thought to be required. The events had been previously identified from the literature as typical of events experienced by children in four given age groups. The correlations between the groups of raters (131 teacher, 25 pediatricians, and 87 mental health workers in child psychiatry) were very high, exceeding 0.92, on all four scales (Coddington, 1983, p. 3). The preschool scale had 30 items with mathematically adjusted LCU values ranging from 21 for "decrease in number of arguments between parents" to 89 for "death of a parent" (Coddington, 1972a, pp. 13-14). Paulucci (1977), following a consultation with Coddington, added one event "move to a different house or apartment" (Paulucci, pp. 34,177).

Coddington (1972b) conducted followup investigations in which he gathered life event data from 3600 individuals, 806 of whom were parents of preschool children. The average age-related LCU scores were plotted on a graph resulting in a curve which Coddington identified "as parallelling the

physical growth curve" (1983, p. 4). Some modifications were made to the original scale to clarify the statements identifying life events; these modifications were reflected in both the scale utilized by Paulucci (1977), Coddington's (personal communication, May 24, 1983) most recent scales, and the scale that was utilized in this study. The growth curve identified an average number of LCU's which could be anticipated in a normal year for a child within that age range. For example, the average number of LCU's for a preschool child was determined to be 62.77 if the child had not been hospitalized, 130 (approximated) if the child had been hospitalized, and an average of 64.99 overall for all children in the preschool sample. In addition, an average number of life events for each group was determined which, for preschoolers, was identified as 1.73. Coddington felt that these averages would make it possible to identify children whose health might be at risk by comparing their LCU scores with those of this control population. Paulucci (1977) utilized this scale because "it does appear to discriminate accurately between children who experience high amounts of life change and those who do not" (p. 70). He arbitrarily identified a low change score to be 75 life change units or less and high life change score to be 150 life change units or more (p. 78). With children in grade four Coddington (in press) determined two life event scores

by averaging the responses from the subjects. High life change scores were determined to be over 50 and the low group to be 50 and under (p. 11).

Reliability and Validity

Although Coddington has not tested the Preschool Life Event Scale further, he has investigated both the Life Event Scales for Adolescents (LES-A) and for Children (LES-C). For the purpose of this study, it was assumed that the Preschool Life Event Scale would demonstrate similar levels of reliability and validity under similar test conditions.

Test-retest reliability. In reviewing the literature on test-retest reliability of self-administered questionnaires and, in particular, life event inventories, Coddington (in press) found that a correlation of 0.70 was the best score that could be anticipated. Coddington argued that higher correlations reported in the literature might be due to the use of smaller sample sizes, research assistants collecting data rather than self-administered questionnaires, and/or short test-retest time intervals as opposed to his study in which he mailed questionnaires. When he investigated the test-retest reliability of the LES-A on 120 highschool football players, only 33 completed the study. The results of three separate test-retests, one four months from the first, and the last eleven months from the first test showed that "the reliability of the LES-A

seem[ed] to be inversely related to the length of time between testings" (p. 7). Each time the adolescent was to complete the questionnaire, he was to report only those life events which occurred in the 12 month period just prior to the first test. In effect, the adolescents were being asked to recall events that occurred up to 16 and 23 months after they occurred. Following the first retest interval a correlation of 0.69 was reported, and following the second retest interval, that of 0.67 was reported. Coddington recommended that "more frequent data collection, requiring recall of three to six months, rather than of longer periods" would be advisable.

Horowitz et al. (1977) studied the reliability of life event tests in several situations. He concluded that although the test-retest reliability of these tests was disappointing, possibly due to respondents' "denial, momentary forgetting of even major life events, and by ambiguity of definition inherent in items" (p. 429), it could be utilized for identification of life stress of groups within the population. If the items were weighted according to the degree of stressfulness and if they were weighted according to "temporal remoteness and recency" (p. 429), their value would increase. Coddington built in both types of weighting in his recent scales (R. D. Coddington, personal communication, May 24, 1983). These

modifications have been adopted for the preschool scale to be utilized in this study (see Appendix B). In addition, the use of another scale, the Developmental Profile II, as a measure of health, responded to the concern of Horowitz et al. (1977) that life event scales should not be used in isolation.

Construct validity. Coddington (in press) identified two indicators which reflected construct validity of his scale. In his first study he found high correlations between three groups of mental health professionals when they assigned quantifiable scores to events. In his second study, an anticipated life event curve emerged that paralleled children's growth curves suggesting that as the age of a child increased, so did the number of life events (pp. 3,4).

Criterion-related validity. In order to determine the validity of his methodology of weighting the stressfulness of life events, Coddington (in press) compared his approach with two other methods. Coddington (in press) reported that 18 items of the 60 item Life Event Inventory developed by Van Houten and Golembiewski for use with adolescents were sufficiently similar to 18 items on the LES-A, that a valid comparison could be made. He found a similar rank ordering of events based on weighting. Coddington further reported on the work of Hart, Masuda and Holmes who developed a

formula in which the weighting was expressed as a function of the frequency of the number of occurrences of an event per 1000 adolescents per year. He found correlations between weights for 52 events and weights used in LES-A based on frequency data from 748 adolescents. His findings indicated adequate support for the methodology utilized to develop the LCU scoring system.

Content validity. Coddington (in press) tested the "representativeness of a life event list in relation to all the possible events that could occur" (p. 9) in a prospective study of 84 grade four children and their parents. In this study he utilized the Life Event Scale for Children (LES-C). It was administered on several occasions to the children and to their parents. They were invited to add events not included in the scale. Following several months of data collection, Coddington concluded that the scale was "fairly representative" (p. 10) of the life events which had occurred in their sample. In repeated testing the children added eight items not included on the original LES-C, that is, of the 378 events identified 370 (97%) were already on the LES-C. Furthermore, parents reported 59 additional events, that is, of the 555 events identified 496 (89.4%) were already on the LES-C scale. These additional events were identified by only 15.6% of the parent sample. On the basis of this study, Coddington concluded that this

scale demonstrated "reasonable content validity" (p. 10).

In addition, he performed an item analysis (in press) on the LES-A with 63 adolescent boys. Although he found that ten items seemed unreliable according to the boys' scores, he concluded that some participants may not have read the directions correctly, and reported events that happened over a longer period of time (p. 8).

Palmer's (1981) study which utilized Coddington's scale as part of her own, supported his findings even though Palmer added items to the scale prior to its administration and, in addition, elicited other life events from the adolescent sample.

Concurrent validity. This was tested by Coddington (in press) utilizing the LES-A. A sample of 33 parents and their 33 sons reported life events that occurred in two different time periods. Inter-rater reliability, though not exceptionally high, was better on recent (0.45) rather than on past family events (0.37). Similar results were evident for desirable events which occurred outside the family (0.55); however, disagreement was apparent if the events were seen as undesirable (0.10). Coddington (in press) concluded that individual perception was the source of error that was introduced into this study. He also suggested that adolescent boys may have been more likely to share their positive experiences with their parents and to keep their

negative experiences to themselves. He concluded that inter-rater reliability showed marked decreases with the passing of time.

This variability in reporting between parents and their children was also identified in the study of 84 grade four children. Therefore, there was some question in regard to the concurrent validity of the scales, including the one for preschoolers. Previous discussion related to the difficulty in eliciting this type of information from younger populations, suggested that these anticipated difficulties outweighed the potential problems with concurrent validity when studying very young children. Further support for this approach was identified in the literature review from the observation that all aspects of the life of a preschool child were thought to be better known to the child's parents than they would be at a later stage in the child's life. Therefore, in this study, parents rather than their children were asked to report life events experienced by their children. This approach also followed the practice of Coddington (1972b) and Paulucci (1977) in their studies of this age group.

Predictive validity. In his study of 84 children and their parents at three different times throughout the year, Coddington (in press) measured the intelligence, academic performance, absenteeism, and classroom behaviour

of the child, and family supportiveness. He found that if both the LES-C and intelligence scores of the child were known, the teacher could predict 80-95% of the children who would have academic problems during the school year (in press, pp. 13-14). In addition, when these scores were combined he found an 85% prediction rate for behaviour problems, a 20% increase in prediction when intelligence scores alone were used. Family supportiveness was found to further increase the predictive success of these scores when used together. Coddington also found that when the instrument was administered in the first grading period the LES-C had reasonable predictive validity for behaviour problems, thus indicating its potential usefulness for screening.

Weighted versus Unweighted Scores

In his review of the literature Coddington (in press) noted that some researchers found little variability between raw scores of life events and weighted scores in LCUs. He concluded that if the scales are to be utilized for prediction, weighted scores are slightly more accurate. In one of his studies with fourth grade students, he found that utilizing totals of raw scores lowered the predictive ability of the LES-C from 0.61 to 0.57 in the second grading period (p. 17). Although Coddington recommended weighted scoring as preferable, both weighted and raw scores were

assigned for each child in this study.

Modifications

A modified Life Event Scale for Preschoolers was utilized in this study. The format was similar to the most recent LES-A and LES-C instruments developed by Coddington (personal communication, May 24, 1983).

Some of the modifications included the following. First, the wording of items was altered from the original format (1972b) only if a more suitable alternative was found in the recent scales of Coddington (personal communication, May 24, 1983) or Paulucci (1977, pp. 170-171). For example, "serious illness requiring hospitalization of a brother or sister" was changed to "hospitalization of a brother or sister".

Second, all items on the original preschool instrument were retained even though some of them did not appear on Paulucci's modified inventory or Coddington's LES-C or LES-A inventories. For example, "having a visible congenital deformity" was retained for this study. No rationale had been provided by either researcher for its deletion from their inventories.

Third, two new items were added to the original. One was from Paulucci's (1977) instrument. In consultation with Coddington, Paulucci added "move to a different house or apartment". The second was added by Coddington to his

LES-C, "death of a pet". Both items had face validity for the preschool child.

Fourth, alterations were made to the original weighted scores that had been ascribed to each life event. Whenever Coddington's recent inventory raised a score, this was the weight adopted for this study. When Coddington's score on the LES-C or LES-A was lower than that of the original score, it was left at the higher original score. Coddington's early work on the inventories offered support to the concept of retaining the higher scores for the younger preschool child. The primary influence in the life of a child at this age is the family which is reflected in the source of most of the events on the preschool inventory. The child has few if any other support systems to buffer or dilute the impact of life change. The younger child, therefore, is likely to be affected to a greater degree by most life events than would be an older child.

Fifth, paralleling Coddington's newer scales, there were four columns indicating the quartile in the calendar year that a life event occurred. The inclusion of these columns had face validity in that their presence was thought to assist the respondent to focus in specific time frames. They also provided an opportunity for the recording of repeat occurrences of specific events. For example, it was possible that a child might experience the loss of two

grandparents within one year. It was also necessary to allow for Coddington's new method of scoring which was supported by Horowitz et al. (1977) in which time and LCU scores were inversely related (see Appendix B).

Sixth, in keeping with Coddington's method of determining content validity, a section was added to the end of the inventory which invited the mother or primary caretaker to add any life events not previously listed on the inventory.

Summary

The modified version of the Life Event Scale for Preschoolers was utilized in this study to measure life change. Its potential usefulness as a tool was based on the work by Coddington (in press) in establishing the reliability and validity of similar tools for older age groups. R. D. Coddington (personal communication, May 24, 1983) made limited modifications to the Life Event Scale for Adolescents (LES-A) and the Life Event Scale for children (LES-C) following these studies. The reliability and validity of the preschool scale is assumed, from the results of these studies, to meet the requirements of an instrument to be utilized in this study.

Developmental Profile II

Alpern and Boll developed the first Developmental Profile in 1972 (Alpern et al., 1980). The Developmental Profile II was a revision of this earlier edition, based on several years of clinical experience and feedback from its users: it was shorter with improved instructions; had graphic capability in scoring to demonstrate a child's progress; was free from sexist language; and provided guidelines specific to the purpose of the user ("preface").

Developmental Profile II was described as "an inventory of skills designed to assess a child's development from birth through age nine" (p. 1) which could be administered within 20 to 40 minutes. Age norms were provided for particular skills in five areas: physical, self-help, social, academic, and communication. The profile was capable of determining whether or not a child had developed a specific skill. Once the skills of the child had been determined, a comparison could be made between the developmental age level and the level at which the child should be functioning at the child's chronological age. A total developmental score, as well as five specific subscores, could be obtained. From these scores it could be determined whether the child was "advanced" or "delayed" in each of the five areas (p. 11). Tables were provided in the Manual as guidelines to determine if the findings indicated

a significant lag or delay in development (pp. 12-14).

Reliability and Validity

Inter-rater reliability. Two investigations were conducted by Alpern et al. (1980) to demonstrate inter-rater reliability. The first was performed on a group of 36 teachers from preschool Head Start programs. They were given one lecture on its use, one demonstration during which they were to score one scale independently, a followup question and answer period, and another demonstration interview on a new scale which they were to score. The score sheets were collected and the participants were then informed that the scores would be analyzed in a study. Thirty teachers (89%) were within one point of the correct score and all were within two points.

A more rigorous investigation was conducted by the same researchers in which the same mother was interviewed on two different days by two different interviewers. On a sample of 11 mothers, the results were as follows: 92% of the scores were within three points; 68% were within two points; 50% were within one point; and 22% were identical (p. 36). The average difference in points on all scales for all subjects was 1.74 points. Final statistical analysis using a "'t' test for correlated means indicated there was no statistically significant difference between the two scores obtained by the two interviewers, two or three days apart"

(p. 36). They concluded that the Developmental Profile demonstrated scorer, reporter, and test-retest reliability.

Standardization. The Manual (Alpern et al., 1980) provided a comprehensive report of investigations done by the developers of the tool. The instrument was standardized by interviewing over 3,000 mothers who were pre-selected to "insure a) the 'normality' of their child, b) the reliability of their reporting, and c) their representativeness of a particular segment of the population" (p. 16). Normality of the child was assessed by these criteria:

a) The pregnancy of the mother over 7 1/2 months in length. b) The child was neither hospitalized for more than 2 weeks after birth nor was in an incubator for a time longer than considered standard for normal children. c) The child had not suffered a seizure, had any congenital, physical, or mental handicap, suffered a serious or unusual illness, been on any continuing medication program, undergone long hospitalization nor had been seen for treatment by psychiatrists, psychologists, speech therapists, physical therapists, or educational therapists" (p. 16).

Such stringent criteria were not utilized in the present study.

The reliability of the reporter was determined in several ways. The reporter was either the child's natural mother, or lived with the child at least twelve months prior to the interview. Interviewers were allowed to assess the reporter's interest, motivation, and knowledge of her child. If the interviewer deemed her lacking in any of

these areas, the data was discarded. In addition, a secondary scoring system allowed the interviewer to record impressions of responses given; the response was perceived as "'valid', 'validity uncertain', or 'invalid'" (p. 17). The data were discarded if less than 85% of the responses were 'valid'.

The sample was assessed on an ongoing basis for its representativeness according to age, sex, and race. Social class membership was evaluated according to the occupation of the head of the household utilizing the North-Hatt Occupational Scale. The results demonstrated that the Profile had been successfully standardized "without bias as to sex, race, or social class" (p. 36). The developers admit that while they considered the Profile to be appropriate for use with Black children, others would not. They also stated that it cannot be used with confidence for any groups other than "White" or "Black". However, they reported that the techniques utilized in the development of the Profile allowed "a single set of norms to be validly used for all social classes" (p. 18).

In regard to geographic characteristics, they recognized that the instrument was limited in that it was standardized using subjects from only two states, Indiana (sample size of 91%) and Washington (9%). However, they mentioned that the inventory had been distributed nationally

and proven useful with many populations that were not represented in their standardization sample. Furthermore, in relation to the size of the home community, 89% of the sample was from large cities (over 25,000 population). This factor is significant in that the children studied in this investigation were from a large city. In addition, Burke utilized this inventory in a study conducted in the Toronto area in 1979. She found that it met the needs of her study in assessing both handicapped and normal children who lived in a large Canadian city.

Criterion-related validity. Alpern et al. (1980) discussed the instrument's criterion-related validity by assessing parts of it in relation to two other developmental measures. Because the Developmental Profile II measured five different areas of development, it was not possible to find another comparable measure. The academic scale was tested against other tests of intelligence. The outcome was that this scale's validity was found to be sufficiently high that an I.Q. Equivalence (I.Q.E.) score was derived that could be applied whenever the subscale was utilized. Even though the I.Q.E. tended to underestimate I.Q. of above-average and overestimate I.Q. of below average children, it could be very useful for children in the middle range.

One study was performed in which the dental age of

children was compared to their developmental age as measured by this inventory and their chronological age. The correlation was 0.90 between chronological age and the physical subscale and was 0.96 between dental developmental age and the physical subscale. More studies demonstrating criterion-related validity on the physical subscale, in particular, as well as on the subscales of self-help, social, and communication would increase the validity of the instrument.

Content validity. Another study was conducted on the original inventory to construct a new up-to-date version. An in depth item analysis was done. The number of items was reduced by 30% from 318 to 217. An item was discarded if there was no clear discrimination between the social classes, races, or sexes of the children. The final version contained only those items representative of 75% of the standardized population; scales that were free from bias toward race and sex; and scales that allowed for actual differences identified in the literature to exist between social classes. The current revision further reduced the number of items to 186 by eliminating all items for children aged 11 to 16 (Alpern et al., 1980, p. 30).

Concurrent validity. In another study Alpern et al. (1980) tested the correspondence between what mothers indicated their children could do and the actual performance

of the children. The original inventory was converted wherever possible to a direct test of the abilities of the child. They used 197 (62%) of the items in this manner. The sample included 100 children (45 females, 55 males; 12 blacks, 88 whites) ranging in age from 3 months to 12 years. Each age level was tested on 5 to 12 subjects. Of 8,709 observations, 7,351 (84%) were in agreement. Each of the subscales had similar levels ranging from 81 to 87% agreement. A more efficient result was found on the final version of the Profile with an 84-88% agreement. Finally, they found no differences resulting from race or sex discrimination. This was an important study because it found that mothers can report on the development of their children with a relatively high degree of accuracy when the Developmental Profile was used. However, they acknowledged that their sample of mothers may not have been representative of all mothers. For example, the mothers volunteered their participation, knew their children were being tested at the same time as they were being interviewed, and had no pressure from external issues that would motivate them to offer inflated reports of their children's abilities.

Summary

From these reports, it was concluded that the Developmental Profile has some tested reliability and

validity. The standardization study offered evidence of the validity of the instrument to assess children's developmental ages providing they were "Black and White urban mid-Americans of all social classes" (Alpern et al., 1980, p. 32). In many respects the general population of Thunder Bay contained many of the components from which the tool was standardized, that is, white, urban, mid-Canada/America, lower and middle social classes; however, the city does not have a significant black or upper class component.

For the purpose of this investigation, the Developmental Profile II was administered exactly as indicated in the Manual. The Manual allowed considerable latitude to the person conducting the interview in asking questions to the person being interviewed, providing the intent and content of the question were not lost.

Scoring was conducted also in accordance with the Manual. A total score as well as five subscores were derived for comparison with each child's chronological age.

Background Information

This instrument was designed by the investigator to meet the needs of this study. The purpose of the changes to the other two instruments was to gain information considered to be important in the analysis of the data.

For example, there were some items which were included to determine the degree to which the sample was representative of the target population. This information aided in the determination of the degree to which the results of the study could be generalized (Veney & Kaluzny, 1984, p. 262). Therefore, items related to education, occupation, employment, ethnic background, sex of the child, and total family income were requested. Several of these same items have been identified by Mausner and Bahn (1974) as important predictors of health. They stated that "despite the egalitarian aspirations of the country, socioeconomic status and color continue to be important predictors of health status throughout life. Other factors pertinent to health are occupation, marital status, and other family variables" (p. 60).

Some items were included because they were thought to identify potential stressors in the life of the child not identified by the Life Event Inventory. These included some socioeconomic indicators, as well as the items related to the number of people in the household, and the marital status of the primary caretaker.

The sex of the child was thought to be a potentially significant factor in the data analysis. Some literature indicated that male children may be more sensitive to change or that they may show overt responses to change more than

female children (Porter & O'Leary, 1980; Quay, 1977; Quay & Peterson, 1979).

One item was similar to a criterion used by Alpern et al. (1980) in the standardization study for pre-screening mothers. This item identified the length of time that the mother or primary caretaker had lived with the child in order to shed some light on a situation where there may have been some question as to how well the child was known to the respondent.

Ethical Considerations

The rights of the subjects were protected. Subjects participated in the study by informed voluntary consent. Those wishing to participate indicated their intention by returning to the school a preliminary "informal" consent form in which the student status of the investigator at the University of Manitoba was identified (see Appendix A). Once the investigator received these forms, the respondents selected were contacted. Information provided in the initial letter was reinforced and elaborated. The respondents were informed of the right to withdraw at any time. If the respondents met the prescreening criteria for the study, the interviewer invited questions and a verbal consent to continue (see Appendix C). When this was

granted, and there was a delay in the appointment of longer than one week, a letter was forwarded to each respondent with a brief summary of the time and place established for the interview, and a phone number at which the interviewer could be reached (see Appendix D). At the beginning of the interview and following data collection, the respondent's right to withdraw at any time was reinforced. The respondents were advised that if they were to request withdrawal from the study after data was collected, they could also request that the data they provided be destroyed.

In order to formalize the willingness of the respondents to participate, two copies of a formal consent form (see Appendix E) were provided, read, and signed at the beginning of each interview. This was done following a further explanation of the study, as well as of the rights and privileges of the participants.

Confidentiality and anonymity were assured, both in regard to the individual participants, as well as in regard to the institutions from which they were selected. The respondents were informed that participation in this study would have no effect on the education of their children. All were advised that a summary report with grouped data would be available to the families and to the participating schools. Further, the respondents were advised that the results of the study might be published but that such

publication would not in any way identify them nor the schools.

Even though anonymity was promised, the investigator retained a method for identifying the source of data until after the study was completed. This access was felt to be necessary in case a respondent requested that the data provided be destroyed and not included in the results of the study; the investigator recognized a child whose health may have been at risk following scoring of the instruments; or there was a followup study for all participants who agreed to be contacted at a later time. At the end of each interview the respondents were asked if they wished to know the results of the developmental assessment. The interviewer did not offer to provide treatment, but if desired by the respondent, the interviewer provided the participant with the results. If the respondent had wished further assistance, the investigator would have recommended appropriate referral. This need did not appear.

In order to ensure confidentiality, as well as to reduce investigator bias, the file of each respondent was coded in a manner that neither the individual nor the school the child attended, could be identified. The consent forms and codes were retained in a file separate from the data.

The respondents were advised that the consents which could identify their raw data would be destroyed upon

completion of the thesis. They were also advised that the raw data would be retained in the event that secondary analysis was desirable at a later date.

In order to further ensure that all reasonable precautions have been taken to protect the subjects of this study, this proposal was submitted to the University of Manitoba School of Nursing Ethical Review Committee for its approval (see Appendix F). Following this process, formal permission was sought and received from the separate and public school boards for entry into their school systems as outlined in the section on procedure (see also Appendix G).

Pilot Study

A preliminary study with a sample of four mothers was conducted by the investigator with volunteers from the target population. The procedures outlined were followed but day care centres were utilized rather than the junior kindergartens. The primary purpose of the pilot study was (1) to familiarize the investigator with the instruments to be utilized in the study; and (2) to identify any procedural difficulties in advance. These purposes were accomplished. No procedural difficulties were identified.

Procedure

General

Access to both separate and public schools having junior kindergarten classes was formally sought following the prescribed research protocols for entering their systems (see Appendix G). The two school boards were asked to provide the investigator with the names of the schools in which junior kindergarten classes were held and the number of individual children in each school.

Both school boards granted permission for access to their systems (see Appendix H). Rather than approach every school in each Board's jurisdiction, assistance was provided by their senior staff in the selection of schools which would be broadly representative of the junior kindergarten population, both geographically and socioeconomically. Census tract subdivisions were utilized for accurate population density groupings. Notification regarding the study was sent to each principal of each school selected by the investigator in consultation with the senior staff member (see Appendix I). Eight schools from the Public School System having an enrollment of 334 junior kindergarten children, and five schools from the Separate School System having an enrollment of 217 junior kindergarten children (totalling 551), were utilized. The

numbers invited to participate in the study approximated the distribution of children within each system, that is, the Public School System to the Separate School System was about 6:4.

The literature indicated that response rates tended to be very low where volunteers are invited to participate through nonpersonal methods of contact such as letters or advertisements (Kerlinger, 1973, p. 414; Mausner & Bahn, 1974, pp. 140-142; Polit & Hungler, p. 204; Veney & Kaluzny, 1984, chap. 14). However, for reasons previously discussed in the section describing the sample, only a nonpersonal method was feasible for this study.

A printed letter with an informal tear off consent was provided to each school selected for each junior kindergarten child (see Appendix A). The teachers were requested to distribute one to each child and to collect those that were signed and returned.

Approximately one week later all returned consents were picked up and placed in coded envelopes, one per school. A total of 112 consents were returned, 73 from the Public School System and 39 from the Separate School System. Each consent was coded for school and the name of the child to protect the anonymity of the participants and to avoid bias in subject selection (Mausner & Bahn, 1974). From those schools for which more consents were returned than was

required, subjects were selected randomly. The number per school was determined by the enrollment of each school and its geographic placement. Sixty-seven subjects were selected from the Public System and 34 were selected from the Separate School System. Four more subjects were added from the pilot study to complete the sample of 105 subjects.

Respondents were telephoned during the time designated by each participant to be personally convenient. This interview accomplished the following. First, the interviewer introduced herself, the purpose of the study, the procedure that was to be followed, and then answered any questions (see Appendix C). Second, the respondent was assessed to establish the suitability of the child and primary caretaker according to the criteria for sample selection previously identified for this study. All respondents contacted met the criteria. Third, even though the respondent may have met these criteria, the respondent was provided the opportunity to withdraw consent to participate. One person withdrew at this time due to illness, bringing the sample size to 104. Fourth, if the respondent was willing to continue to participate in the study, an interview was arranged at a time and place that was mutually suitable to both the primary caretaker and the interviewer. The child did not have to be present. The respondent was given a telephone number at which the

interviewer could be reached in the event that the appointment had to be changed. A letter was sent confirming the interview for time and place when the time between the telephone call and the interview was longer than one week (see Appendix D).

Interviewers

Seven fourth year nursing students and the investigator served as interviewers. Each contacted their own respondents. The nursing students were trained by the investigator in the administration of the instruments utilized in this study. Inter-rater reliability was determined by having the investigator interview two mothers while the students scored the instruments. In the first interview, three different errors were made by four persons, due to an inability to hear the mother's response to one question giving a total of seven errors out of a possible 1260 items. In the second interview two errors were made by the same person or two errors of out a possible 1260 items (see Table 1).

Table 1

Results of Testing the Reliability of Interviewers on the
Developmental Profile II

	Mother #1			Mother #2		
	Quest. #	No. of Errors	No. of Raters	Quest. #	No. of Errors	No. of Raters
Physical	36	1	2	35	1	1
Self-Help	32	1	4	20	1	1
Social	-	-	-	-	-	-
Academic	-	-	-	-	-	-
Communication	33	1	1	-	-	-
Total	3 errors x 4 persons			2 errors x 1 person		

Interviews

The data was collected over a period of two months, December 1984 to January 1985. Each interviewer met with the child's primary caretaker. Each interview took approximately one to one and a half hours. Formal consent and the three instruments were easily completed in this time. The majority of interviews were conducted in the homes of the respondents.

At the beginning of the interview the respondent was reminded of the rights and privileges of participants in this study (see Appendix E and Ethical Considerations). In addition, each respondent was requested to sign two copies of the formal consent forms. One copy of the formal consent form was retained by the respondent. (The initial consents returned to the school were indentified as the "informal" consents; whereas, the consents signed at the time of the interview were identified as the "formal" consents.)

At the completion of the interview the three questionnaires were returned to the investigator in a brown envelope for each respondent. The consents were then filed separately from the data on the instruments.

Data Analysis

Both descriptive statistics and nonparametric statistical tests were used to organize the data for this study. The background information was summarized with descriptive statistics while the data from the two other instruments was summarized with descriptive statistics and analyzed using nonparametric statistical tests.

Nonparametric tests were particularly useful because the data were discrete, and non-distributive (Sokal & Rohlf, 1969, p. 387). Non-distributive refers to the form of the theoretical population frequency; insufficient data were available to make inferences about the form of the population frequency prior to the study (Mendenhall & Ramey, 1973, pp. 80-81). The sample was relatively small and was not representative of the general population of preschool children. The sample was a convenience sample, and although an attempt was made to select schools in a manner that allowed for geographic and socioeconomic representativeness, the sample may not be random.

In order to determine the strength of the relationship between the two variables under study, life change and health, the degree of association was determined with a Spearman Rank Correlation Coefficient (Siegel, 1956, pp. 213-233). This type of statistical evaluation is

valuable when "there is no reason for distinguishing one variable as independent and the other as dependent"

(Mendenhall & Ramey, 1973, p. 300).

Once the data was collected and additional variables were examined, further analysis of the data occurred. For example, the distributions of children by sex and influence of family size were examined utilizing the Mann-Whitney U Test, which compares two distributions without ignoring the relative magnitudes of the observations (Sokal & Rohlf, 1969). To compare different subsets of data other statistical tests were utilized, such as a Multiple Comparison Procedure for a Friedman Two Way Analysis of Variance and the Kruskal-Wallis One Way Analysis of Variance (Daniel, 1978).

Limitations

The limitations of the study were related to the design of the study and the sample. The first limitation related to the design was that the study required recall of retrospective data from the respondents. Even though the longest period of recall required was one year for the Life Event Scale, nevertheless bias was introduced in terms of memory selectivity of the respondents (Horowitz et al., 1977).

A second limitation related to the design was that the respondents may have provided only what they perceived to be the responses desired by the investigator. When the Developmental Profile (Alpern et al., 1980) was previously tested for concurrent validity under optimal conditions, 16% overall of the reported responses were found to be inaccurate. On the other hand, 84% agreement was perceived to be a high level of agreement. In an effort to modify this form of bias, the interviewers provided assurance that there were no right or wrong answers to any of the questions.

A third limitation related to the design was that the reliability and validity of the Preschool Life Event Scale has not been tested directly. Coddington (personal communication, May 1984) tested reliability and validity of LES-C and LES-A which do not include preschool children.

A fourth limitation, related to the convenience sample, was the difficulty in generalizing the results to the larger population. There was little known about the form of the frequency distribution of the population, and no opportunity to randomize the sample, given the restrictions of the institutions where children of this age were located. For these reasons, a sample of convenience was the only sampling method possible for this study. Some control was attempted within the schools from which more than one consent was

received. For example, if one school returned eight consents, the number required (according to percentage of children within that school compared to the total junior kindergarten school population) might be four. The four were then chosen by random selection. However, as there were only three schools where a larger number of consents was received than required, such randomization would probably have had a negligible impact. Further control was attempted in the selection of schools from a broad geographic distribution in both school systems.

Because little research has been done in the area under study, an exploratory study seemed the most appropriate design. One purpose of exploratory studies is to generate hypotheses. Because of this purpose the inability to generalize, in the strict sense, was accepted as a limitation of the design.

RESULTS

Life Change and Health

Quantitative Data

From this experiment, there was no evidence of a relationship between life change and the health of young children. There was no association between the operational measures of life change (LCU) and health (physical, social, self-help, academic, and communication Developmental Quotients) (Spearman Rank Correlation Coefficient, 0.05 level of significance) (see Table 2).

The two operational measures of life change (LCU, Raw Scores) were strongly related (Spearman Rank Correlation Coefficient = 0.96, $t = 32.5$, $p < 0.001$). This correlation value is not corrected for tied ranks. Raw life change has the greatest number of ties of any set of data in the results. When the correlation was corrected for ties, the correlation coefficient became 0.95, which is a trivial change. All other correlation coefficients in the results would be changed to a smaller degree by any ties. Other researchers (Coddington, in press; Gersten et al., 1974) had found a similar strong correlation between these

Table 2

Comparison of the LCU Values with the Mean Developmental
Quotient and With Each of Its Operational Measures

Compared Ranks LCU	Spearman Rank Correlation Coefficient	Student's t
Mean DQ	-0.08	0.76*
Physical DQ	-0.10	1.00*
Self-Help	-0.04	0.35*
Social	-0.14	1.46*
Academic	-0.16	1.67*
Communication	-0.03	0.31*

* t not significant at 0.025 level for a one-tailed test.
The compared groups are not associated.

indicators. Because the correlations was almost unity, any variable compared to one would have the same association as compared to the other. Because of this, and because Raw Scores had so many ties, comparison of life change to health was only done with LCU weighted values. This choice was supported by the contention of Coddington (in press) that weighted values were somewhat more accurate (p. 17).

The result of the comparison of the LCU values with the mean of the five operational measures of Developmental Quotients (DQ) was representative of the comparison of the LCU values with each of the five operational measures (see Table 2). Statistically, forming the mean of the five measures of DQ from the five subsets of data assumed the subsets were from the same population; since this may not be true, tests were performed to check this assumption. The five subsets of DQs were checked for similarity to be sure the averaging did not obscure a valuable finding. In fact, the five operational measures of DQ form two significantly different subsets in a Multiple Comparison Procedure for a Friedman Two Way Analysis of Variance ($F_{17}^2 = 23.1 > X_{.995}^2$ ($\nu = 4$) = 14.9, $p < 0.005$; experimentwise error rate = 0.15). The two subsets were: physical, self-help, social, and communication; and academic and communication. The two subsets may arise because of technical difficulties. The academic DQ may appear in a separate subset because the

authors of Developmental Profile had worked hard to refine this section of the test to develop an Intelligence Developmental Quotient (IQE) comparable to previously existing intelligence tests (Alpern et al., 1980). Communication may appear in both subsets because there was such a large variability in its scores. Because communication is in both subsets and in the same subset as academic, it confuses the interpretation of why academic is found in a separate subset. Since only technical explanations can be found to account for the presence of these two subsets, it was assumed that the subgroups were from the same population. Therefore, the mean was used in further computations.

The life change scores were divided into three subgroups (see Table 3). Since there was a wide variation of scores, an attempt was made to have the same numbers of specific numerical values in each subgroup. But, the low life change subgroup contained a somewhat larger number because the majority of the children in this group had experienced two life events (Raw Scores). The total sample life change scores ranged between 32 and 461 with a mean score of 132, including the scores of hospitalized children, and 131 for those not hospitalized. Coddington's (1972b) study provided a mean score of 62.77 if the child had not been hospitalized, and 130 (approximated) if the child had

Table 3

Distribution of Sample According to Life Change Scores
(Subgroups and Total Sample)

Subgroup	Range of Scores	Mean
Low <u>n</u> = 39 (37.5%)	32 - 89	61.9
Medium <u>n</u> = 32 (30.8%)	93 - 149	117.9
High <u>n</u> = 33 (31.7%)	150 - 461	225.5
Total <u>n</u> = 104 (100%)	32 - 461	132.0

been hospitalized. The variation in mean scores between Coddington's results and those found in this study may be due to procedural differences. Coddington's results came from a study in 1972 that preceded his more recent work with older children in which he recommended a different scoring approach (in press). In the first study if an event occurred more than one time in a twelve month period, only one score was given. In this study if an event occurred more than one time in a twelve month period, it was assigned a score for each occurrence. Further, some of the weights for specific life events were altered from the original scale in keeping with weights on more recent scales.

The Developmental Profile II scores were converted to a Developmental Quotient (DQ) which gave the "normal" score of 100 for each subcategory as well as for the mean DQ.

Table 4 shows the mean DQ for each LCU subgroup of the total sample. The sets of means for DQs in the low subgroup, medium subgroup, and high subgroup were not different (Kruskal-Wallis One Way Analysis of Variance, $H = 1.56 < \chi^2_{.95} (\nu = 2) = 7.4$, 0.05 level of significance).

The three subgroups were further subdivided to identify female and male scores (see Table 5). Males and females did not differ in life change or in health of children. There were no differences in the operational measure of life change or in each of the operational measures of DQ

Table 4

Mean Developmental Quotient (DQ) for LCU Subgroups

LCU Subgroups	Range DQ	Mean DQ
Low	105 - 165	133
Medium	94 - 159	132
High	95 - 167	130

Table 5

Subgroup Distribution of Sample According to Sex

Subgroup	LCU		Mean DQ	
	Range of Scores	Mean	Range of Scores	Mean
Female (<u>n</u> = 52; 50%)	32 - 461	121.3	94 - 166	132.7
Male (<u>n</u> = 52; 50%)	32 - 363	142.8	106 - 167	130.9

(Mann-Whitney U Test, 0.05 level of significance: for LCU, $Z = 1.15$; for physical, $Z = 0.218$; for self-help, $Z = 0.312$; for social, $Z = 0.474$; for academic, $Z = 0.312$; for communication, $Z = 0.168$). However, again the five operational measures of DQ formed subsets in a Multiple Comparison Procedure for a Friedman Two-Way Analysis of Variance (for males there were two groups: physical, self-help, social, and academic; academic and communication, Friedman $\chi^2_r = 10.0 > \chi^2_{.95} (V = 4) = 9.5$, $p < 0.05$ experimentwise error = 0.15; for females there were two groups: physical, self-help, social, academic, communication and social, academic, communication, Friedman $\chi^2_r = 15.9 > \chi^2_{.95} (V = 4) = 14.9$, $p < 0.005$ experimentwise error = 0.15). It is clear from the female results that variability in the data confuses any substantive meaning that could be derived from having the two different subsets.

Children in different sized families did not have different DQs. For family sizes of 3, 4, and 5 members there were not differences among LCUs or among sets of means of DQs (Kruskal-Wallis One Way Analysis of Variance, $H = 0.77 < \chi^2_{.95} (V = 2) = 7.4$, 0.05 level of significance). Family sizes of 2, 6 and larger were not sufficiently well represented to justify this type of analysis (see Table 6).

Finally, children who had been hospitalized were

Table 6

Influence of Family Size on LCUs and DQs

Family Size #	LCU		DQ	
	<u>n</u>	Mean	<u>n</u>	Mean
2	6	-	6	-
3	13	131.8	13	139.6
4	51	125.3	51	129.6
5	28	119.7	28	132.5
6	4	-	4	-
7	1	-	1	-
8	-	-	-	-
9	1	-	1	-
	<u>104</u>		<u>104</u>	

compared with those who had not been hospitalized. The average DQs of hospitalized subjects were separated into three groups--low, medium, and high LCU values. There are no significant differences among the three sets of values (see Table 7) (Kruskal-Wallis One Way Analysis of Variance, $H = 0.04 < \chi^2_{.95} (\nu = 2) = 6.0$, 0.05 level of significance). The average DQs of non-hospitalized subjects were separated into three groups--low, medium, and high LCU values. There are no significant differences among the three subsets (Kruskal-Wallis One Way Analysis of Variance, $H = 1.56 < \chi^2_{.95} (\nu = 2) = 6.0$, 0.05 level of significance). The average DQs of the hospitalized subjects were compared to those of the non-hospitalized subjects. There is no difference between the hospitalized and non-hospitalized subjects (Mann-Whitney U Test, $p(Z \geq 0.5890) = 0.28$, 0.05 level of significance).

Qualitative Life Change Data

Primary caretakers were provided with an opportunity to add items to the Life Event Inventory (see Appendix J). Forty-six (44%) of the respondents identified 58 additional events. Of these, 54 were given scores paralleling events of the Life Event Inventory as recommended by Coddington (in press). Three events did not receive any score because two events occurred prior to the 12 months under study, and one

Table 7

Influence of Hospitalization on DQS

LCU Subgroups	Hospitalized		Non-Hospitalized	
	<u>n</u>	Mean	<u>n</u>	Mean
Low	6	133	33	133
Medium	6	134	26	132
High	10	135	23	128

"change of dancing school", was deemed too difficult to score without further information.

Characteristics of Children and Primary Caretakers

Routine characteristics of children and primary caretakers were analyzed. These included: sex, age, family characteristics, educational level, religious affiliation, ethnic origin, occupations, and family income. The perception by the primary caretaker of the health of the child was also reported. Where possible, a comparison was made to the same characteristics of the population of Thunder Bay.

Sex of the Children and Primary Caretakers

Of the 104 subjects in the sample, 50% (52) were male and 50% (52) were female.

The primary caretakers interviewed were 96% (100) mothers, 3% (3) fathers, and 1% (1) where both parents were present.

Age of the Children and Family Members

All of the children were born in 1980, and were four years old.

The age of mothers in the sample was between 19 and 38 years, with the mean age being 29.8 years. The age of the fathers was between 23 and 47 years of age, with the mean age being 32.3 years. The ages of the siblings in the families ranged from below one to 14 years.

Family Characteristics

Family size varied from two (single-parent plus child in the sample) to seven (two parents plus five children) with the majority of children in the sample being from families with two children (the subject plus one sibling). Fifty-four percent (56) of the subjects had one sibling, 26% (27) had two siblings, 16% (17) were only children, 3% (3) had three siblings, and 1% (1) had four siblings. The participants reported a mean number of children at home of 2.2 with a range of 1 to 5.

One child in the sample was adopted, whereas all the others were identified as the natural child of at least one of the adults with whom the child lived.

The marital status of the primary caretakers was not representative of the general population of Thunder Bay. For example, on the one hand, they reported a significant underrepresentation in the single status and widowed and, on the other hand, a marked overrepresentation in the married and divorced categories (see Table 8). In part, this may be

Table 8

Marital Status of Primary Caretakers for Sample Compared to
Population of Thunder Bay

Status	Sample		Thunder Bay	
	<u>n</u>	%	N	%
Single	6	6	24,285	27
Married	81	78	55,455	63
Widowed	1	1	6,625	7
Divorced	13	13	2,195	2
Unknown	3	3		
	104	101*	88,560	99*

* rounding error

n = sample size

N = population size

the result of no category for "separated" in the Census reporting; the investigator included those indicating this status under the category "divorced". Two homes had adolescent boarders, while four had an aunt, uncle, or grandparent living with the family.

For those 22 (21%) children in the sample who were separated from one or more of their biological (natural) parents, seven (7%) of them were reported as never seeing their parent(s). One of these children was adopted. The remaining 16 (15%) children visited their parent(s) as frequently as twice per week or as infrequently as twice per year (see Table 9).

Ninety-eight percent (98%) of the primary caretakers interviewed reported that they had lived with the child in the sample since birth, while 2% had lived with the child for more than one year. Thus, the persons interviewed should have had sufficient information about the child to respond to the questionnaires knowledgeably.

Educational Level for Parents of Sampled Children

The educational levels of the parents varied considerably. The educational level of the mothers ranged from completion of Grade 8 to completion of two undergraduate degrees, whereas the educational level of the fathers, which was somewhat higher, ranged from completion to Grade 9 to

Table 9

Children Who Were Separated from One or More Biological
(Natural) Parent(s) Including Visiting Frequencies (n = 16)

	0	2/wk.	1/wk.	2/mo.	1/mo.	1/2mo.	2/yr.	Infreq.
Never	7							
Sometimes	1		5	4	2	1	1	2

completion of graduate school at the Masters level. The educational level of the parents in the sample was not representative of the educational level distribution of the population of Thunder Bay for the same age ranges (see Table 10).

Religious Affiliation for Parents of Sampled Children

Religious affiliation for mothers and for fathers is shown in Table 11. The parents were usually of the same religion. Parental religious affiliations were distributed similarly to that of the general population of Thunder Bay except in the category "Other" where the sample was overrepresented.

Ethnic Origin for Parents of Sampled Children

The ethnic background of the parents of the children in the sample was broadly distributed (see Table 12). A total of 15 different ethnic backgrounds were identified, with 13 reported for both fathers and mothers. It appears that, in comparison with the Thunder Bay population, the sample was overrepresented for fathers of German, and Scandinavian ethnicity, and for mothers of French, German, and Scandinavian ethnicity. The sample was also underrepresented in the general population for fathers in "Other" category and for

Table 10

Educational Level for Parents of Sampled Children Compared
to Population of Thunder Bay

Level	Mothers Thunder Bay+				Fathers ThunderBay+			
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Less than Grade 9	1	1	1,475	7	-	-	3,255	12
Grade 9-13	58	57	9,215	44	43	50	9,765	35
Trades certificate or diploma and other non-university education only	22	22	7,520	37	19	22	10,435	38
University (no graduation)	2	2	795	4	7	8	1,230	4
University with bachelor's degree or higher	19	19	1,750	8	17	20	3,075	11
	<u>102</u>	<u>101*</u>	<u>20,755</u>	<u>100</u>	<u>86</u>	<u>100</u>	<u>27,760</u>	<u>100</u>
Missing data	2				18			
	<u>104</u>				<u>104</u>			

* rounding error

+ ranges for mothers: ages 20-44; for fathers: ages 20-54

Table 11

Religious Affiliation for Parents of Sampled Children
Compared to Population of Thunder Bay

Religion	Mothers		Thunder Bay		Fathers		Thunder Bay	
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Protestant	51	49	31,950	54	46	51	29,685	49
Catholic	41	39	23,390	39	32	36	24,385	41
Jewish	1	1	45	Tr	-	-	55	Tr
None	6	6	2,835	5	7	8	4,365	7
Other	5	5	1,490	2	5	6	1,510	3
Baha'I	1				1			
Christian	2				2			
Greek Orthodox					1			
Ukranian								
Orthodox	2				1			
Catholic								
	<u>104</u>	<u>100</u>	<u>59,710</u>	<u>100</u>	<u>90</u>	<u>101*</u>	<u>60,010</u>	<u>100</u>
Missing data					<u>14</u>			
					104			

* rounding error

Tr = below 0.05%

Table 12

Ethnic Origins of Parents of Children in Sample Compared to
Population of Thunder Bay

Origins	Mothers Thunder Bay				Fathers Thunder Bay			
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
British	41	39	24,375	48	44	42	23,050	45
Italian	5	5	4,585	9	7	7	5,130	10
Ukranian	11	11	4,750	9	11	11	4,690	9
French	16	15	3,300	6	9	9	3,500	7
German	7	7	1,655	3	9	9	1,635	3
Scandinavian	13	13	1,395	3	14	14	1,475	3
Native Canadian	3	3	1,190	2	1	1	925	2
Other	8	8	9,400	18	9	9	10,060	20
Czechoslovakian					1			
Dutch	2							
Hungarian	2				1			
Oriental								
Polish	1				3			
Portuguese	1				1			
Slovak					1			
Spanish					1			
Unknown	1				1			
	104	101*	51,225	98*	104	102*	51,260	99*

* rounding error

mothers in the British, Italian, and "Other" category. Therefore, the parents of the sample can not be considered as representative of the ethnic distribution of the total population of Thunder Bay.

Occupations for Parents of Sampled Children

The distribution of parents in the sample by major occupational groups showed considerable variation from those of the general population of Thunder Bay (see Table 13). For fathers there was a significant overrepresentation in the managerial or administrative services, and forestry and logging occupations. There was a marked underrepresentation in teaching, clerical, processing, construction, transport equipment operating, and material handling occupations. For mothers, there was a significant overrepresentation in the teaching, medicine and health, artistic, literary, and recreational; and forestry and logging occupations with a marked underrepresentation in managerial, social sciences, and service occupations. Fathers were reported as 4% unemployed, much less than the 7% reported for Thunder Bay. Four mothers indicated they were full-time students. Twenty-nine (29) of the primary caretakers indicated that there was one adult in the home eligible for and interested in working and was currently unemployed. Since only 4% of the 85 fathers was reported as being unemployed, it is safe

Table 13

Occupations for Parents of Sampled Children Compared to
Population of Thunder Bay (Labour Force Categories by
Occupation Major Groups Based on 1971 Census Classification)

Classification	Mothers				Fathers			
	Sample		Thunder Bay		Sample		Thunder Bay	
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Managerial, Administrative and Related	-	-	890	4	19	23	2,525	8
Natural Sciences, Engineering and Mathematics	-	-	200	1	3	4	1,475	4
Social Sciences and Related	-	-	700	3	2	2	500	1
Religion	-	-	20	Tr	-	-	140	Tr
Teaching and Related	8	17	1,425	6	1	1	1,085	3
Medicine and Health	9	20	2,685	11	2	2	575	2
Artistic, Literary, Recreational, and Related	4	9	295	1	-	-	360	1
Clerical and Related	12	26	8,045	32	2	2	2,100	6

Tr = Trace, below 0.05%

Table 13 (cont'd)

Occupations for Parents of Sampled Children Compared to
Population of Thunder Bay (Labour Force Categories by
Occupation Major Groups Based on 1971 Census Classification)

Classification	Mothers				Fathers			
	Sample		Thunder Bay		Sample		Thunder Bay	
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Sales-Commerce	5	11	3,115	12	4	5	2,875	7
Service	4	9	5,455	22	18	22	3,115	8
Farming, Horticultural and Animal Husbandary	-	-	250	1	1	1	665	2
Fishing, Hunting, Trapping and Related	-	-	10	Tr	-	-	35	Tr
Forestry and Logging	2	4	65	Tr	4	5	780	2
Mining and Quarrying	-	-	10	Tr	-	-	215	Tr
Processing Occupations	-	-	225	1	-	-	3,570	10
Machining and Related	-	-	55	Tr	5	6	1,475	4

Tr = Trace, below 0.05%

Table 13 (cont'd)

Occupations for Parents of Sampled Children Compared to
Population of Thunder Bay (Labour Force Categories by
Occupation Major Groups Based on 1971 Census Classification)

Classification	Mothers				Fathers			
	Sample		Thunder Bay		Sample		Thunder Bay	
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Product Fabricating, Assembling and Repairing	-	-	325	1	8	10	4,175	11
Construction Trades	-	-	70	Tr	4	5	4,085	11
Transport Equipment Operating	1	2	365	1	3	4	2,900	8
Material Handling and Related	-	-	110	Tr	-	-	1,880	5
Other Crafts and Equipment Operating	-	-	125	Tr	2	2	545	1
Occupations Not Elsewhere Classified	1	2	165	1	3	4	1,180	3
Occupations	-	-	765	3	-	-	1,130	3

Tr = Trace, below 0.05%

Table 13 (cont'd)

Occupations for Parents of Sampled Children Compared to
Population of Thunder Bay (Labour Force Categories by
Occupation Major Groups Based on 1971 Census Classification)

Classification	Mothers				Fathers			
	Sample		Thunder Bay		Sample		Thunder Bay	
	<u>n</u>	%	N	%	<u>n</u>	%	N	%
Not Stated								
	46	98*	25,350	100	81	98*	37,390	100
Student	4							
Unemployed					3	4	4,320	7
	50				84			
Missing Data	+54				20			

* rounding error

+ 54 reported occupation as "housewife" or "homemaker"

^ Unemployed of Thunder Bay - not included in total Thunder Bay figures and percentage.

to assume that the majority of the 29 individuals seeking employment could be women.

Family Income

Total family income of the sample was not representative of the family income of the general population of Thunder Bay (see Table 14). The sample was considerably overrepresented in the "\$25,000 and over" income bracket and underrepresented in all the other brackets. This was obvious even though the first income level in the study was not identical to that utilized by Census Canada, that is, "less than \$5,000" rather than "less than \$4,000" respectively.

Health of Sampled Children

All but one primary caretaker reported that the child in the sample was "healthy". The child had apparently experienced a large number of colds.

Nevertheless, fourteen (13%) of the children in the sample, were currently being treated by a physician for an illness. Five (5) of these children were reported to have had a long-standing problem, whereas seven (7) were reported to have experienced the illness recently. One (1) did not report on these items. Nine of the 14 children were reported to require continuing medical supervision for their

Table 14

Total Family Income

	Sample		Thunder Bay	
	<u>n</u>	%	N	%
Less than \$4,000			27,570	33
Less than \$5,000	4	4		
\$5,000 - 10,000	6	6	11,935	14
\$10,000 - 15,000	4	4	11,965	15
\$15,000 - 20,000	4	4	9,880	12
\$20,000 - 25,000	9	9	9,355	11
\$25,000 and over	69	73	11,655	14
	<hr/>	<hr/>	<hr/>	<hr/>
	96	100	82,360	99*
Do Not Know	7			
Do Not Wish to Respond	1			
	<hr/>			
	104			

*Rounding error

illness.

Five of the children had an experience of being hospitalized from one to three days. Two of these children were reported to have been upset by the experience.

DISCUSSION AND IMPLICATIONS FOR NURSING

From previous studies outlined in the Introduction and Review of the Literature, a supposition was presented that life change and health in a person were related, and that an accumulation of stressful life changes frequently had negative effects on the health of the individual. This was found to be true for adults, adolescents, and children of school age (Dohrenwend & Dohrenwend, 1974). Although little research had been conducted, there were strong indications that preschool children also fit this supposition. The interrelatedness of health and development of children at this age was supported both in the literature and in current practices of professionals responsible for assessing the development of children. The growing public awareness of the desirability for early detection and prevention of illness challenged the investigator to select this age group for study. For these reasons, I tested preschool children, but found no association between life change and health. There was no relationship between the number of life events (Raw Scores or LCU weighted scores) and the mean or subscores of the Developmental Profile II. This was true for each subgroup of LCU scores--low, medium, and high--as well

as for sex and family size. The above supposition, then, may be limited to people of school age or over; or the conceptual basis of the instruments for testing older people may be inadequate to test preschoolers. There are both methodological and substantive reasons to consider.

Methodological Considerations

Design

Additional designs should be considered in future studies. This study was exploratory. Questions concerning the appropriateness of the specific instruments arise. Events that were stressful to the sampled children might differ from those on the Life Event Inventory. In addition, items on the Developmental Profile II may no longer be appropriate for the assigned ages. A descriptive study with direct observation of a small sample of children periodically over time could provide a rich source of data relevant to both life change and health, the two variables tested by these tools. Factors specific to children in this community, as well as factors relevant to their development in 1985, may be identified. This could provide an opportunity to validate the tools used in this present study as well as to generate new hypotheses for future investigations. Or, a similar study to this report could be

conducted as a longitudinal study either with this sample or with a randomized sample.

Sample

The limitations of a convenience sample were recognized in the Methodology. Except for religious affiliation, the sample was not representative of the general population of Thunder Bay: the parents proved to be somewhat better educated; the fathers overrepresented in occupations of higher income, stability, and status; and total family income considerably overrepresented the "\$25,000 and over" bracket of the general population of Thunder Bay. The scores on the Developmental Profile II were suggestive of a sample which was not representative of the general population of Thunder Bay. The sample of this investigation did not contain any children with developmental problems. Even though standardization studies had not been done on children in this city, and even though there are no appreciable "Black" or "higher class" subgroups, the results of the standardization study done by Alpern et al. (1980) appeared to be transferable to this population. Another result may have been obtained if the sample was representative of the population of the city of Thunder Bay. The responses to the question "Do you consider your child to be healthy?" were all in the affirmative but one.

This child had had a number of upper respiratory infections, but little evidence from the Life Event Inventory of an unusually high score. The child had experienced three life changes (LCU score = 110) which consisted of "beginning preschool (first time)", "change in parents' financial status", and "mother beginning to work outside the home". There was no evidence that any other unusual circumstances existed in the life of this child. This further indicates that the sample was probably not representative of the population in terms of health status. However, it also points out a potential weakness, in that, the study did not request more specific data regarding the health history of the child (Hart et al., 1978). For example, in future studies, information could be sought regarding frequency of respiratory infections and gastrointestinal upsets, allergies, and other illnesses (Barnard & Douglas, 1974). Such data would be more consistent with the indicators of health status utilized in most previous life event research (Holmes & Rahe, 1967; Jacobs & Charles, 1980; Petrich & Holmes, 1977).

Family income is not usually considered among routine characteristics underlying the instruments. Yet family income is the one demographic variable that stands out as being the most exaggerated difference between the characteristics of the sample and the general population.

Poverty has been clearly identified in the literature (Caouette, 1979; Kohn & Rossman, 1974; Lancaster, 1981; Richmond, 1967, p. 657) as a major source of chronic stress. It is possible, therefore, that since approximately 20% of the sample had high life change scores and yet showed no indication of developmental delay through a low Developmental Quotient (DQ) score, that family income could be a potential mediating variable allaying the impact of stressful life change on health of young children and should be included in future investigations.

The sample size was 7.7% of the population of Thunder Bay. This was quite large compared to standard public opinion polls, which used sample sizes of less than 0.2% of the population (Adams, 1985). Thus, the size of the sample, per se, was not likely a problem.

Procedure

A number of procedural issues may have had an impact on the results of this investigation. Even though the interviewers demonstrated high inter-rater reliability at the outset, no further check was performed. Although continuous rechecking of inter-rater reliability might have been done, at the time it did not appear necessary given the small number of interviews conducted by each interviewer. Further, if there was not adequate rapport between the

interviewer and respondent, the responses may not be accurate, introducing the possibility of interviewer bias (Polit & Hungler, 1978, p. 352).

Alpern et al. (1980) found that while mothers could report accurately, there was "no data on whether mothers will report their children's skills accurately" (p. 33). Observation and interview of the children, as well as the primary caretakers, may have provided more accurate data. The student interviewers in this investigation questioned whether or not they were always interviewing the true primary caretaker, particularly when the mother was the respondent and worked. On the Developmental Profile II, the student interviewers suggested that more accurate information might have been attained from a teacher or day care worker (Ollendick & LaBerteaux, 1978). In future investigations, other adults as well as parents could be included in the assessment of the child's skills.

There may be a further problem concerning the participant filling out the questionnaire in the presence of the interviewer rather than being asked about each event specifically. Some respondents may have misunderstood instructions, or may have been too shy to ask for interpretations of instructions. Inaccurate results could have occurred without the knowledge of the interviewer.

Instruments

Life Event Inventory

Pertinent to this study may be the difficulty of determining if the report of the primary caretakers had inaccuracies due to poor recall or an intent to give a biased picture. Inaccuracy of memory has been identified in the Review of the Literature as a major weakness of Life Event Inventories. Specific events reported to have taken place within the previous 12 months may in fact have occurred long before that time, or not occurred at all; some events may not have been reported. Coddington (in press) found that the longer the span of time for reporting events from the actual occurrence of the event, the lower the correlation in test-retest reliability studies.

Future investigations could modify the length of time for reporting of certain events. For example, Paulucci (1977) asked both parents to report on specific life events that had occurred over the previous four years and found that the father's report on the inventory was negatively correlated with the child's ability to perform on the McCarthy Scales of Children's Abilities. Since children at this age are most affected by what occurs in their immediate family environment, future investigations might include parental reports of their own life change utilizing the Holmes and Rahe Inventory (1967). Furthermore, questions

regarding the validity of this instrument arose from Coddington 's (in press) study in which he tested for concurrent validity. This study yielded low correlations: 0.45 on recent family events; 0.37 on past family events; 0.55 on desirable events; 0.10 on undesirable events.

Preschool children have very little control over events which affect their lives. In one study by Fairbanks and Hough (1979) events beyond the control of individuals were not linked to the occurrence of illness. The Life Event Inventory for Preschool children includes items that largely are not in the control of the child.

Preschool children may not be affected by stressful life change in the same way as older persons. Children at this age tend to be spontaneous in their responses to day to day changes in their lives. They may not yet be socialized to repress these responses. The Review of the Literature suggested that adults in today's society are usually unable to respond to automatic "fight" or "flight" physiological mechanisms. Over time this lack of response appropriate to the body's normal reactions will lead to gradual destruction of tissues (Bates, 1979). Persons in upper management employment, where self-control is a highly valued quality, were identified in the literature as having more stress-related illnesses than the normal population (Hinkle, Christenson, Kane & Ostfeld, 1958; Hinkle & Wolff, 1957).

Preschool children are in a slower stage of physical growth and development compared to earlier stages of their development (Barnard & Douglas, 1974, p. 142) and may not be as immediately vulnerable to the impact of life change as at another age (Murphy & Moriarty, 1976; Oakeshott, 1973; Yates, 1983, p. 131).

The specific weights assigned to each event for preschool children may be inaccurate. The raters in Coddington (1972a) were all adults and they may have misrepresented the actual degree of readjustment required by children. There is evidence in the literature that some children respond to life change as though they are invulnerable, and others respond to the smallest alteration as though they are like glass dolls, too fragile to survive the slightest knock (Anthony, 1974b; Burke, 1980; Garnezy, 1976; Murphy, 1974; Murphy & Moriarty, 1976). Individual perception, coping skills, support systems, genetic endowment, and previous experience (Burke, 1978, p. 7; Dohrenwend, 1973; Garrison & Earls, 1983) are not taken into account in this type of Inventory. It may be possible that the sample under investigation in the current study, experienced a number of intervening variables that buffered the effects of life change and allowed for normal growth and development to proceed. Coddington (in press) indicated a strong desire to pursue family support systems as the next

avenue of research into the relationships between stressful life events and a child's environment. Coddington and his colleagues are developing a measure of family supportiveness (in press, p. 20). He stated that tools such as the LES-C or LES-A cannot have wider application until "some equally valid measure of family and extrafamilial support systems" (p. 21) is available. Such development would increase the value of LES in efforts to prevent effects of stress in the child's environment.

Another criticism that may be relevant to the findings in the study is that Life Event Inventories do not take into account the multidimensional and complex nature of stress. Burke (1978), in reporting on the Sullivan group investigation of stress and pregnancy, stated that they found that "using the Schedule and Holmes and Rahe's criteria, that most pregnant women should have been seriously ill, but they were not" (p. 31). The work by Holmes and Rahe (1967, 1972) and Coddington (1972a, 1972b) implied that stress and its impact can be determined by an additive score. However, in this area Burke (1978) demonstrated a clear link between Developmental Quotient and non-specific familial strain, and not between Developmental Quotient and specifically identified stressors. The best choice is not clear. In addition, Holmes and Rahe (1967) did not take into account other intervening variables which

may be operative in mollifying the impact of life change. These will be discussed further.

Another limitation with the Coddington scale is its lack of recent development and standardization on the population from which the sample was drawn. For example, it is questionable whether "beginning preschool for the first time" should be included when all children in this sample, and most within Thunder Bay, are all experiencing this life event at approximately the same time. Other events may be more relevant to these children than the ones included on the list developed in 1972 (see Appendix J). Weightings of scores may be different. Some adjustments were made in the instrument for use in this study that were in keeping with Coddington's recent work on the School Age Inventory; however, events specific to preschoolers may be different. The increasing frequency of divorce and separation within society, suggesting an increased tolerance for these life events, may make the events less stressful for the child to experience.

Developmental Profile II

From the literature reviewed and for the needs of this study the Developmental Profile II was the best instrument for measuring developmental status in the preschool child. However, it may not be the best discriminator for children experiencing high life change. Doeff (1981) raised concern

over the reliability and validity of developmental assessments of preschool children. She stated that they "are frequently insensitive to the complex issues . . . in promoting healthy growth and development" (p. 44). Garrity and Servos (1978) found that certain developmental tests were better at discriminating between problem and nonproblem children.

Because of limitations in developmental tests, there should be longitudinal studies of normal children before developmental tests can be taken seriously as predictive of future potential. Thorpe and Werner (1974) identified several limitations in developmental tests "because their norms are based on small samples of children who are often not representative of the children later screened" (p. 362). They strongly recommend the introduction longitudinal studies of normal children. Although the Developmental Profile II was standardized on a large sample of children that might be considered similar to the population of children, it cannot be assumed that the norms in Thunder Bay would be the same without further testing of the tool. In fact, there is a strong likelihood that restandardization will be necessary even on children from the same area where the study was first done. Since it was first developed, there has been a large increase in the number of four year old children who are attending preschool educational

facilities. All of the children in the sample of the present study were attending junior kindergarten. It is quite possible that the norms would alter considerably if a further standardization study was done. Certainly, exposure to developmental tasks at an earlier stage of life may enhance the skill to perform that task at that early stage, thus giving a false score for all children in the sample.

However, this cannot be the sole explanation for my results, as simply lowering the scores to account for the inflated results would not account for the lack of correlation of these scores within the life change subgroups.

Substantive Considerations

The indicators of health used in this research may be insufficient for such a study. Historically, health has been measured by the absence of disease or its precursors. However, Siegel (1973) concluded that health factors which prevent disease are not necessarily the factors which promote health. Only in the recent past have attempts been made to identify indicators of health. Much of this work is still at the biological level. Most of the social and psychological testing of health arose from pathology. Conceptually, health is now being defined as a multivariate

process of living. Just as disease is now perceived as having a number of contributing factors, so is health being considered in the same light. Milsum (1980) stated that "no single factor is sufficient to maintain health" (p. 1). Even though the Developmental Profile II considered five different areas of development, future studies might include other direct indicators of health such as growth factors. Height and weight are well known variables, height being a more accurate predictive measure of future health status (Barnard & Douglas, 1974). Variables that are not necessarily direct measures of, but may be related to, health could be considered in future research. These might include one or more of the following: health history of the child including developmental milestones, allergies, upper respiratory infections, and gastrointestinal upsets (Hart et al., 1978); physical assessment; behavioural checklist (O'Leary, Emery & Porter, 1981; Quay & Peterson, 1979) including toileting, nightmares, absenteeism from preschool, and personal habits (Elliott, 1977); anxiety level (Bolton, 1979, p. 611); sense of competence through measures of self-concept (Berlin, 1975) and/or self-esteem (Coopersmith, 1976, p. 372); temperament (Cameron, 1977, 1978); patterns of eating, sleeping, and exercising (Milsum, 1980); family health history and current health status (Forrest, 1981, p. 139); family interaction (Brown, 1975;

Elardo & Bradley, 1981; Funke-Furber, 1978; Turner, 1970); and/or family as a support system (Coddington, in press; Miller, 1982; Minuchin, 1974). Milsum (1980) stated that "health may be characterized for different persons by variously weighted combinations of . . . four aspects [of health] . . . : physical, mental, social and spiritual" (p. 2) each of which could be identified by one or more of the above indicators. He also identified an important question regarding the process by which an individual moves from one health state to another under stressful conditions. However, using these different variables may not cast more light on the relationship between life change and health. Bruhn et al. (1977) concluded after a thorough review of the literature that "no single index or cluster of factors [exists] that can be used to measure or to assess an individual's health" (p. 210).

The developmental status of an individual, particularly a child, was well supported in the Review of the Literature as an appropriate indicator of health. Siegel (1973) stated that "human developmental processes may have more significance for health in the future than disease" (p. 283); however, the current status of such tools as the Developmental Profile II may be too simplistic and insensitive to be utilized as a sole measure to indicate health status of children at this age. The lack of evidence

of gross developmental delay may not necessarily indicate a good health status.

There were no differences between males and females in the Life Event Inventory and in the Developmental Profile II. Neither Coddington (1972b) nor Alpern et al. (1980) found any differences between males and females.

Among families of 3, 4, and 5 people, there were no differences in the relationship between life change and health. This was not surprising. The literature suggesting that the larger the family, the less time there would be available for each child with the consequence of limiting the potential support for the child in times of stress, was referring to families of larger numbers (Hymovich & Chamberlin, 1980; Lahey, Hammer, Crumrine & Forehand, 1980; Rae Grant, 1979). Future investigations might attempt to balance the sample in terms of family size and to stratify the sample to include larger numbers of families whose sizes were not well represented in this study.

Implications for Nursing

If, on the one hand, preschoolers do not fit the supposition that life change and health are related, and that an accumulation of stressful life changes frequently has negative effects on the health of individuals, nurses

could direct their efforts to other areas of health promotion and illness prevention. Stress management and amelioration of the environment would not be important issues for this particular age group.

If, on the other hand, the supposition does fit but the study failed to demonstrate a relationship between the variables of life change and health due to methodological or substantive considerations, then, further research is required. The support for the supposition expressed in the Review of the Literature and in clinical practice is sufficient to warrant pursuit of this avenue of research. Early identification of persons at risk for stress-related illnesses which may occur later in life but have their beginnings in childhood, definitely has potential for future development of preventive programs.

It is premature, however, to identify more specific implications for nursing until the questions generated by this study have been further explored.

Summary and Recommendations

It is not clear whether preschool children fit the supposition that life change and health in adults, adolescents, and school-age children are related, and that stressful life changes result in negative effects on the

health of these persons. In the experiments reported in this thesis there was no association between life change and health in the preschool child. But preliminary evidence elsewhere suggests that there should be a relationship. It is possible that methods used for the test, and concepts used to produce these methods, were inadequate; thus, whether preschool children do or do not fit the above supposition is still an open question.

The exploratory, experimental design may not have been the correct choice. A descriptive longitudinal design would provide richer, more accurate data.

The results from a convenience sampling technique must be suspect, but criticism of the technique alone is not sufficient to explain the difference between the actual results and the anticipated results.

Family income was markedly different from the population. Therefore, family income should be included as a possible intervening variable in future investigations.

Questionnaire administrative techniques may have been faulty. Inter-rater reliability checks might be increased. Reliability of the reporting of the primary caretaker should be checked by including other adults who know the child well, such as teachers. Interviewers might fill out the Life Event Inventory with the participants, rather than having the primary caretakers doing them on their own in the

presence of the interviewer.

The instruments may not be appropriate as presently developed. The results of the Life Event Inventory could be strengthened by instituting a test-retest reliability check. In an effort to discriminate between those events over which a child has control and those over which the child has little or no control, the Life Event Inventory could be modified to invite respondents to identify each item in this manner. Analysis could be performed to determine if an association exists between life change scores and health according to those events over which the child has control and those events over which the child has little or no control.

The actual events considered in this study may have been insufficient. Life Event Inventories could be done by both parents as well as for the child.

Preschool children may not respond to stress in the same way as older people and the assigned weightings may be inaccurate. The instruments and methods of data collection may have to be altered considerably to include some preliminary descriptive observations as to how children of this age react to stress. Raw scores appeared to be just as accurate as weighted scores. They could be used in future investigations.

Only a limited number of intervening variables were

analyzed for potential impact on the relationship between life change and health. Future studies might include intervening variables related to the impact of stress such as individual perception, coping skills, support systems, genetic endowment, and previous experience.

There was a lack of standardization of the Life Event Inventory subject population. There may have to be a readjustment of the weightings of scores, and items may need to be added or deleted.

Developmental instruments may not be sensitive to complex aspects of health, growth, and development. A longitudinal study including several indicators, direct and indirect, of health may be necessary.

Identification of indicators of health is a relatively new study. More, or different, indicators may be needed for a proper understanding of the relationship of life change and health of preschool children.

Family size made no difference. Future studies might use a stratified sample to include larger family sizes.

Hospitalization made no difference. Future studies might use an equally matched sample of children who had been or were presently hospitalized compared to children not hospitalized. Specific criteria regarding the length of hospitalization and the reasons for the hospitalization might be considered.

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Appendix A

Invitation to Participate,
Informal Consent

Dear Parent:

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I am studying how changes in the lives of four year old children are related to their health. We are beginning to believe more that a number of changes that occur in children's lives may be significantly related to their health. To investigate this further, I need your help.

This study arises from work I am doing as a graduate student at the University of Manitoba School of Nursing and my interest in children as a public health nurse. Currently I am a professor at the School of Nursing Lakehead University here in Thunder Bay.

I am inviting you to participate in this study. You would be interviewed at a time and place, such as your home, that is convenient to you. Your child will not be involved in the interview. No information about you or your child will be shared with anyone, including the school. At the end of the study all participants will receive feedback on the outcome of the study.

If you wish to participate in this study, please fill out the attached consent form and have your child return it to the teacher within one week. Once your completed consent form is received, you will be contacted by telephone to arrange an interview.

If you have any questions, I can be reached most evenings, after 7 p.m., at 345-0363.

Sincerely,



Sandra L. Summers, R.N., B.Sc.N.

CONSENT TO PARTICIPATE

IN A STUDY ABOUT CHILDREN AND THEIR HEALTH BY SANDRA SUMMERS, R.N.

I, (Mr/Ms/Mrs) _____, have a child born
(circle one) (PRINT NAME)
in 1980 and I am interested in participating in this study. I wish
to be contacted at _____ between the hours of _____
(PHONE NUMBER) (BEST TIMES)

My address is: _____

Child's name: _____ Your signature: _____

Thank you for your cooperation

Appendix B
Instruments

CODES: _____

FACE SHEET

SCHOOL CODE: _____ INTERVIEWER: _____

RESPONDENT CODE: _____ CHILD'S SEX: _____

DATE INFORMAL CONSENT RECEIVED: _____

DATE OF TELEPHONE INTERVIEW: ____/____/____ PARTICPATE? Yes [] No []

MET THE CRITERIA: Yes [] No []

DATE CONFIRMATION LETTER SENT: _____

RECEIVED: Yes [] No []

DATE OF FACE TO FACE INTERVIEW: _____

2 Formal Consents - Signed: Yes [] No []

Respondent kept one Yes [] No []

2nd Filed Yes [] No []

Life Event Inventory - Completed: Yes [] No []

Background Information - Completed: Yes [] No []

Developmental ProfileII - Completed: Yes [] No []

Instruments in Respondent File: Yes [] No []

SUMMARY OF DATA: Scores LEI-P: LCU _____ Raw _____

DPII : Total _____

Physical _____

Self-Help _____

Social _____

Academic _____

Communication _____

☐ FOLLOWUP REPORT ON CHILD: Yes [] No []☐ Referral Yes [] No []☐ FOLLOWUP REPORT OF STUDY: Yes [] No []☐ MAY CONTACT AT LATER DATE: Yes [] No []

Questionnaires

Instructions

Please complete the questionnaires in the best way you can. Instructions are included at the beginning of each section. Please try to answer all questions. There are no right or wrong answers.

If you have difficulty remembering any details, please give the best or closest answer.

Thank you for your cooperation.

RESPONDENT CODE _____

SCHOOL CODE _____

LIFE EVENT INVENTORY--PRESCHOOL (Age 5 and under)

INSTRUCTIONS:

If any of the events listed below occurred in the PAST 12 MONTHS TO YOUR CHILD, place a check (✓) in the correct column on the right.

	FALL Sept Oct Nov	SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb
1. Birth of a brother or sister				
2. End of a problem between parents				
3. Beginning preschool (first time)				
4. Hospitalization of a parent				
5. Start of a new problem between parents				
6. Loss of a job by either parent				
7. Change in child's acceptance by peers				
8. End of a problem between child and parents				
9. Change to a new preschool				
10. Start of a new problem between child and parents				
11. Change in father's job so he has less time home				
12. Hospitalization for illness or injury (child)				

RESPONDENT CODE _____ SCHOOL CODE _____

	FALL Sept Oct Nov	SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb
13. Divorce of parents				
14. Marital separation of parents				
15. Jail sentence of a parent for more than 30 days				
16. Remarriage of parent to a step parent				
17. A new adult moving into your home (eg., a grandparent, etc.)				
18. Death of a brother or sister				
19. Change in parents' financial status				
20. Discovery of being an adopted child				
21. Death of a grandparent				
22. Mother beginning to work outside the home				
23. Death of a close friend (child or adult)				
24. Hospitalization of a brother or sister				
25. Death of a parent				
26. Brother or sister leaving home				
27. Acquiring a visible deformity				

RESPONDENT CODE SCHOOL CODE

	FALL Sept Oct Nov	SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb
28. Jail sentence of parent of 30 days or less				
29. Move to a different house or apartment				
30. Having a visible congenital deformity				
31. Outstanding personal achievement (special prize)				
32. Death of a pet				

List below any events that occurred in the PAST 12 MONTHS TO YOUR CHILD but were not included in the above list and place a check mark in the correct column.

adapted from an instrument by and with permission of R. Dean Coddington, M.D., 1984.

November 1984
S. Summers

CODES: _____

LIFE EVENT INVENTORY--PRESCHOOL (Age 5 and under)

INSTRUCTIONS:

If any of the events listed below occurred the PAST 12 MONTHS TO YOUR CHILD, write the weight in the correct column on the right.

		SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb	FALL Sept Oct Nov
	WEIGHT				
1. Birth of a brother or sister	50				
2. End of a problem between parents	27				
3. Beginning pre-school (first time)	42				
4. Hospitalization of a parent	52				
5. Start of a new problem between parents	44				
6. Loss of a job by either parent	37				
7. Change in child's acceptance by peers	38				
8. End of a problem between child and parents	34				
9. Change to a new pre-school	33				
10. Start of a new problem between child and parents	43				
11. Change in father's job so he has less time home	39				

	WEIGHT	SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb	FALL Sept Oct Nov
12. Hospitalization for illness or injury (child)	59				
13. Divorce of parents	78				
14. Marital separation of parents	74				
15. Jail sentence of a parent for more than 30 days	67				
16. Remarriage of parent to a step parent	62				
17. A new adult moving into your home (e.g., a grandparent, etc.)	41				
18. Death of a brother or sister	86				
19. Change in parents' financial status	21				
20. Discovery of being an adopted child	33				
21. Death of a grandparent	56				
22. Mother beginning to work outside the home	47				
23. Death of a close friend (child or adult)	52				
24. Hospitalization of a brother or sister	47				
25. Death of a parent	109				

	WEIGHT	SUMMER June July Aug	SPRING Mar Apr May	WINTER Dec Jan Feb	FALL Sept Oct Nov
26. Brother or sister leaving home	39				
27. Acquiring a visible deformity	52				
28. Jail sentence of parent of 30 days or less	34				
29. Move to a different house or apartment	35				
30. Having a visible congenital deformity	39				
31. Outstanding personal achievement (special prize)	34				
32. Death of a pet	40				
II. List below any events that occurred in the PAST 12 MONTHS but were not included in the above list and place a check mark in the correct column.					

adapted from, and with permission of R. Dean Coddington, M.D., 1984.

SCORING INSTRUCTIONS: LIFE EVENT INVENTORY

1. If any events were added at the bottom of the page, a weight must be assigned. Use the weight assigned to some similar event on the list and place it in the appropriate column.
2. Three-month Scores are computed simply by adding the numbers in each column.
3. Six-month Scores must be adjusted to allow for the attenuation of the effect of events that occurred more than three months ago. To do so add the most recent Three-month Score to 75% of the next most recent Three-month Score.
Example: A child participating in a study in mid-January reported to the following recent Three-month Scores: Summer 80, Fall, 40, Winter), and Spring 50. The most recent Three-month Score is 40 and the next most recent 80. The Six-month Score is $40 + (75\% \text{ of } 80) = 40 + 60 = 100$.
4. Nine-month Scores can be determined by adding 50% of the next most recent Three-month Score to the Six-month Score. In the above example this would be (50% of 50) since the study was carried out in January, added to 100. The Nine-month Score is 125.
5. One-year Scores are computed in the same way, adding 25% of the most distant Three-month Score, 0 in this example.

INTERPRETATION OF SCORES:

The table below can be used as a guide, the figures are not precise and may not be generalized to other geographic locations. The majority of healthy children and adolescents will obtain scores below these figures. Higher scores seem to increase risk of behavioural symptomatology two to three fold.

SCORING INSTRUCTIONS: LIFE EVENT INVENTORY (cont'd)

Approximate upper limit score for
seventy-five percent of a young population

Age	Length of Scoring Period			
	Three Months	Six Months	Nine Months	Twelve Months
8-10	50	95	110	110
11-13	60	115	130	135
14-16	75	140	160	170
17-19	90	170	195	200

(from Coddington's 1981 Life Event Scale - Children [6-11
Years])

RESPONDENT CODE SCHOOL CODE BACKGROUND INFORMATION

This section is about your child and the people who live in the same household.

Please follow the instructions given for each section.

☐

1. Is your child a (1)[] Boy; (2)[] Girl?

2. What is your relationship to your child?

☐

(1)[] Mother; (2)[] Father; (3)[] Other (please specify)

☐

3. How many people live in your household? number

4. Please fill in the information requested below. Do not place any names on the chart. Include only those currently living with the child.

	Relation- ship	Sex	Date of Birth	Education Completed	Religion	Occupation
Adults						
1						
2						
3						
4						
Children						
1						
2						
3						
4						
5						
6						
7						
8						

2

RESPONDENT CODE

SCHOOL CODE

5. Is this child:

- ☐ (1) [] the natural child of at least 1 of the adults with whom the child lives?
- ☐ (2) [] an adopted child?
- ☐ (3) [] a foster child?

6. Is there any adult eligible for and interested in working who is currently unemployed? (1) [] Yes; (2) [] No

If the answer was yes, how many?
number

7. What is the ethnic background of the child's

Father		Mother
(1) []	British	[] (1)
(2) []	Italian	[] (2)
(3) []	Ukrainian	[] (3)
(4) []	French	[] (4)
(5) []	German	[] (5)
(6) []	Scandinavian	[] (6)
(7) []	Native Canadian	[] (7)
(8) []	Other <u> </u>	[] (8)
	specify	

8. What is your marital status?

- ☐ (1) [] Single never married
- (2) [] Single divorced
- (3) [] Single widowed
- (4) [] Married never divorced/widowed
- (5) [] Married previously divorced/widowed
- (6) [] Common Law

9. If one or more of the child's natural parents is living somewhere else, does the child see that (those) person(s)?

- ☐ (1) [] Yes; (2) [] No; (3) [] Does not apply.

If the answer was yes, how often?

10. How long have you lived with this child?

- ☐ (1) [] Since the child's birth
- (2) [] more than one year
- (3) [] less than one year

RESPONDENT CODE

3

SCHOOL CODE

11. What is your total family income?

- ☐ (1) [] less than \$ 5,000
☐ (2) [] \$ 5,000 - 10,000
☐ (3) [] 10,000 - 15,000
☐ (4) [] 15,000 - 20,000
☐ (5) [] 20,000 - 25,000
☐ (6) [] 25,000 - 30,000
☐ (7) [] 30,000 - 35,000
☐ (8) [] 35,000 - 40,000
☐ (9) [] 40,000 and over
☐ (10) [] Do not know
☐ (11) [] Do not wish to respond

12. Do you consider your child to be healthy?

☐

(1) [] Yes; (2) [] No

13. Has your child been hospitalized in the past year?

☐

(1) [] Yes; (2) [] No

If the answer is yes, how long was the hospitalization?

Was this experience upsetting for your child?

☐

(1) [] Yes; (2) [] No

14. Is your child currently being treated by a physician for any illness?

☐

(1) [] Yes; (2) [] No

☐

Is this a recent problem? (1) [] Yes; (2) [] No

☐

Is this a long-standing problem? (1) [] Yes; (2) [] No

Will your child require continuing medical supervision

☐

for this problem(s)? (1) [] Yes; (2) [] No

When you have finished, please let the interviewer know.
 The interviewer will collect these sheets from you and
 then begin to ask you questions about your child's develop-
 ment.

Thank you.

Developmental Profile II

Illustrations of some of the items in the Developmental Profile II which were representative of the items appropriate for the age group under study follow. Some items from each subscale will be presented. The letter refers to the scale and the number refers to the item number in that scale.

The Items for 4 Year Olds (Pre-schooler II: 43-54 months)Physical Scale

- P 22. Does the child catch a ball (any size) thrown by an adult who is standing five feet away? The child must catch the ball 50% of the time.
- P 23. Can the child hop forward on one foot for a distance of at least 10 feet without having to stop and start again?
- P 24. Does the child jump rope with one or both feet at least twice; or can the child jump over a number of things in its path without stopping? The "things" should be at least eight inches high.

Self-Help Scale

- S-H 22. Does the child dress completely except for shoe-lace tying and other difficult fastening? The child must manage regular shirt or blouse buttons and zippers.
- S-H 23. Does the child put toys away neatly when asked to do so? (The child may often have to be asked more than once.)
- S-H 24. Can the child fix a bowl of dry cereal? This must include getting the bowl, cereal and milk and pouring both cereal and milk into the bowl.

Social Scale

- S 22. Does the child draw a person so that an adult

could tell what was drawn? It need not be a whole person, but there should be a head and a body or a head and eyes, nose or mouth which any adult could recognize.

- S 23. Is the child allowed to play in her/his own neighbourhood without being watched by an adult? This does not mean the child is allowed to cross the street alone.
- S 24. Does the child know and use (though not always) the terms "thank you", "please", and "you're welcome" at the right times?

Academic Scale

- A 19. When asked to draw a person or when drawing a picture of a person, does the child draw a head that looks like a head and at least one other body part?
- A 20. Can the child tell a penny from a nickel and a dime by naming or pointing to the penny when it is named? The child need not know the value of the coins.
- A 21. Does the child draw or copy a square? The square must have the right angle corners and the sides of the square should be of about equal size.

Communication

- C 22. Has the child sung a song of at least 30 words? Many of the words can be repeated in the song, but the child must sing the song alone.
- C 23. Has the child been able to buy something in a store without help? The child must have let the sales person know exactly what was wanted, paid for the item, and waited for change.
- C 24. Can the child tell people (by speaking or holding up fingers) how old she/he is now, how old she/he was last year, and how old she/he will be next year?

Appendix C

Telephone Interview: I. Verbal;
II. Written Responses

Telephone InterviewI. VerbalIntroduction

Hello, my name is _____. I am calling on behalf of Sandra Summers.

Your child returned a consent form to school in which you indicated an interest in participating in a study that Miss Summers is doing.

Is this a convenient time for us to talk for a few minutes?

[WAIT. Depending on response, make arrangements for an alternative time, or proceed.]

Questions

1. Are you still interested in participating in this study?

[If answer is no, thank the person and terminate the call. If the answer is yes, continue.]

2. Was your child born in 1980?

[If answer is no, thank person and terminate interview. If answer is yes, proceed.]

3. Do you consider yourself to be the person in your family who provides most of the care for this child?

[If answer is no, ask who is. Ask if this other person would be willing to participate. And/or ask if the person to whom you are talking knows the child quite well. If the answer is yes, and there is some question in your mind regarding the individual's ability to understand or read English, proceed.]

4. Is English your first language? If answer is no, Are you comfortable with English?
Do you read English? Write English?

[If at any time the person or the child does not fit the criteria or the person cannot understand or read English, terminate the interview politely and thank the person for participating. Offer a brief explanation why they would not be able to be interviewed for the study. A followup letter

thanking them for their willingness to participate will be sent.]

Study

[Ask]

1. Would you like to know anything about Miss Summers or the study she is conducting?

[Depending on response, may terminate this part of the interview now, answer specific questions, or state the following.]

Miss Summers is a registered nurse and is studying at the University of Manitoba. She currently teaches nursing at Lakehead University. I am (a student nurse, registered nurse) and am helping her with her study by arranging to meet people such as yourself for interviews.

Miss Summers' study has been developed to see if there is a relationship between changes children experience and their health. One of the most common ways to assess children's health is to find out about their development. Either mothers or someone who spends a lot of time looking after a child can answer the questions necessary to assess a child's development.

The interview in which you will take part involves your filling in two questionnaires and my asking you some questions about your child's development. The whole interview should take one to one and a half hours.

Any information that you provide will be held in the strictest confidence.

Do you have any questions?

Are you still interested in participating in the study?

[If the answer is no, terminate the interview graciously.
If the answer is yes, proceed.]

We will need to arrange a time to meet as well as a place. When and where would be most convenient for you? (home, university, restaurant, place of business).

Let me be sure I have the correct information. [Read back.]
I will contact you the day (night) before just to verify the interview. If you have any questions or the time becomes inconvenient for you, please do not hesitate to call me at

_____ or Miss Summers at 345-0363 after 7 p.m. or on the weekends if you cannot reach me.

Thank you for your cooperation.

RESPONDENT CODE _____ SCHOOL CODE _____ Telephone InterviewII Written Responses : Date _____ Time _____

Name _____

Introduction (pencil)

If time is not convenient, arrange another time _____

Questions

1. Child born in 1980? Yes [] No []
2. Primary caretaker? Yes [] No [] Who? _____
3. English, 1st language? Yes [] No []
- If no, comfortable? Yes [] No []
- Read English? Yes [] No []
- Write English? Yes [] No []
- If answer no to either of last two, thanked? Yes [] No []

Questions from interviewee

Participate? Yes [] No []Interview : Time _____ Date _____

Address _____

Directions _____

Appendix D

Letter of Confirmation of Interview Time
If Interview Longer Than One Week
After Appointment Made

Dear

Thank you for agreeing to participate in the study being conducted by Miss Sandra Summers. As indicated on the telephone, the study is to determine if change in children's lives is related to their health.

Miss Summers is a registered nurse and is studying through the University of Manitoba.

This letter is to acknowledge your willingness to participate in the study and to assure you once again that all information you provide will be kept in confidence.

I also wish to confirm with you the date, time and place that we are to meet. This is the information that I believe that we arranged on the telephone.

Date _____ Time _____

Place _____

If, for any reason, this becomes inconvenient for you, please call me between the hours of _____ and _____ at the following number: _____.

I look forward to meeting you in person.

Sincerely,

Appendix E

Rights and Privileges of Respondents/Participants;
Formal Consent

Information Regarding Rights and Privileges of
Respondents/Participants

Interview

My name is _____. We talked on the phone (or, you received a letter indicating that I would come today at this time) about the study I am doing [or, being done by S. Summers] as part of my [her] course of study at the University of Manitoba. Thank you for being willing to participate. Before we begin the questionnaires, I would like to mention a few things that we discussed briefly on the telephone. These are items that you should understand before we continue. Once I have explained them to you and answered any questions you may have, if you are still in agreement to continue to participate, then I will ask you to sign two consent forms. One copy is for you to keep and the other is for our files.

The easiest way to do this is for us to go through the consent form together (attached). I believe everything is covered in it. Please do not hesitate to ask me questions as we go over it together.

[Used consent form as basis for informing participant of rights and privileges.]

CODES: _____

Consent

I, _____, understand what is involved and agree to participate in this study about change in the lives of children and their health. I understand that Sandra L. Summers is the principle investigator and that she is a student at the University of Manitoba, Faculty of Graduate Studies. I understand that I will be interviewed by _____.

I have been informed about the rights and privileges that I have as a participant. I know that I may withdraw from the study at any time and that the information that I provide will be kept in confidence. I understand that no information that I provide will be shared with anyone, including the school. I understand that any reports or publications from this study will protect the anonymity of both my child and myself. I understand that I will receive a summary of the findings of the study when it is completed. I understand that I may receive a report from the investigator about the findings from the developmental assessment of my child.

I understand how I was contacted to become involved in this study and that I agreed to participate with full knowledge of the procedure necessary to complete my part in this study. I understand that this interview will take from 1 to 1 1/2 hours and that my child does not have to be present for the interview.

I understand that any information that could identify the information that I have given, namely, the consent forms, will be kept coded and kept separate from the information itself. I also understand that the principle investigator will retain the information I have given in a form that will not identify me or my child and that the information will be destroyed after it has been analyzed.

I understand that I can contact the interviewer or the principle investigator to answer questions about this study. I understand that I will receive a copy of this signed form the date that it is signed. My signature indicates that I fully understand what is expected of me and that I agree to participate as a volunteer in this study.

(DATE)

(SIGNATURE OF PARTICIPANT/RESPONDENT)

(DATE)

(SIGNATURE OF INTERVIEWER)

(INTERVIEWER'S TELEPHONE)

Appendix F

Ethical Review Committee




THE UNIVERSITY OF MANITOBA

SCHOOL OF NURSING

Room 246 Bison Building
Winnipeg, Manitoba
Canada R3T 2N2

November 6, 1984



Dear Ms. Summers:

I am writing in reply to your letter of October 29, 1984 indicating that your Thesis Committee discussed recommendations put forth by the Ethical Review Committee and that alterations have been made in conformity with the Committee's wishes.

As mentioned in my prior letter to you, your Research Proposal to Study the Relationship Between Life Change and Health of Preschool Children was approved on ethical grounds on September 28, 1984.

On behalf of the Committee, I would like to wish you the best in your research.

Sincerely,

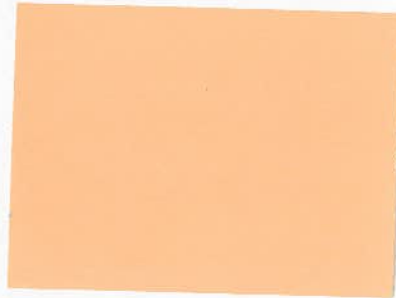


Appendix G

Submissions to The Lakehead Board of Education; and The
Lakehead District Catholic School Board

Submission to the
Lakehead Board of Education

August 20, 1984



RESEARCH APPLICATION FORM

Approved by _____
Superintendent Responsible for Research
The Lakehead Board of Education

Date Approved _____

1. Title of Research: The Relationship Between Life Change and Health of Preschool Children
2. Name of Researcher: Sandra L. Summers
3. Position of Researcher: Student, Masters of Nursing, University of Manitoba, Winnipeg, Manitoba
4. Name of Faculty Advisor: Professor Susan Roe, School of Nursing, University of Manitoba
5. Abstract of Research Proposal

5.1 Purpose:

Children like all people are exposed to changes in their lives. Whenever a child experiences change adjustment is required. Life changes affecting young children most often originate within the family.

Many studies have found significant positive correlations between clustering of life change events and the occurrence of illness in adult populations. Although some similar studies have been done with children and adolescents few investigations have been reported on preschool populations. Life Event Inventories for children and adolescents have been developed by Coddington. Paulucci utilized the tool for preschool children and found a significant correlation between life change events, health and development, and preschool children's performance. The variables health and development appear to be more appropriate in the study of the relationship of life change in the lives of young children than illness variables.

Health and development of children are of particular relevance to nurses who have been involved historically in promoting the health and development of children. Nurses participate in activities directed to the early identification of potential health problems in both healthy and high risk populations. To date these activities have been focused around health

assessments which include physical examinations, developmental screening, history taking, and anticipatory guidance. With increasing awareness of the impact of rapid social change on the lives of children nurses require more knowledge, skill, and tools to help them meet the health needs of the young child. Early identification of potential problems in children exposed to such changes cannot be done without further study. Preliminary studies must be done to determine the relationship between changes occurring in the lives of preschool children and their health.

5.2 Research Design

The design is exploratory-descriptive. Quantitative and qualitative data will be collected utilizing two existing instruments and a demographic questionnaire developed for this investigation. Few causal relationships can be inferred from this design, however hypotheses may be generated from this preliminary study which can be tested in future investigations.

5.3 Methodology

Children in junior kindergarten classes will be provided with a letter (see Appendix A) to take home to their mother or primary caretaker. If the child's mother wishes to be involved in the study she will sign a consent form at the bottom of the letter and return the form with the child to school. After one to two weeks, the investigator will pick up the forms from each participating teacher. The forms will be coded so the school cannot be identified. Geographical representation is desirable, therefore coding is necessary. Mothers will be contacted by telephone or letter to explain the purpose of the study and to arrange an interview if the mother agrees to continue. The interviewer (investigator or trained interviewer) will arrange a meeting of one to one and a half hours. The child does not have to be present. The mother will be asked to sign a consent to participate (see Appendix B) and then to complete two questionnaires (see Appendix C). The interviewer will then ask the mother the questions on the third instrument (see Appendix D). The instruments will be coded with a participant number. No identifying marks will be on the response sheets.

5.4 Method of Reporting Study

The student-investigator will prepare a Masters thesis for review by her thesis committee. It will then be submitted to oral examination and subsequently, in written format, to the University of Manitoba Library as well as to other libraries which are repositories for nursing research. A summary report will be available to the participants, both mothers and schools, if requested. The results of the study may be published in a journal at a later date.

6. Type of Research

6.4 qualitative research design x

6.5 quantitative research design x

7. Data Collection Techniques

7.1 questionnaires x

7.2 formal interview x

7.6 telephone interview x

8. Schools to be contacted: All schools having junior kindergarten classes in the city of Thunder Bay

9. Sample & Size:

	Number	Grade	Times Contacted
Students' mothers	60*	JK	one formal interview

* Even though only 60 mothers are required, many more will be given the opportunity to participate to ensure reaching the goal of 60. In addition, the larger the number of respondents the more control the investigator will have over the final selection of the sample in terms of geographic representation.

10. Budget

10.6 Personal financing

11. Time

11.1 date to start study: September 30, 1984 (approx.)

11.2 people hours required of subject: 1.5 hours

11.2.1. Number of staff: each JK teacher+ x 1.0
hrs. (max.) [time is to distribute letter
and collect consent forms]

+ current number of JK teachers in city
not known to investigator at this time

12. Legal Implications

12.1 Have you assured complete anonymity? No

Participants will be informed that no one but the investigator will have access to the codes; however, a method of identifying the participants' questionnaires will be retained to allow access to the data if the participant wishes to withdraw after data collection and to have data destroyed; or if the participant wishes to receive a report of the child's health status as measured by the developmental testing instrument.

12.2 Have you assured complete confidentiality? Yes

12.3 Is the name of the Board to be identified in the final report?

This depends on the Board's wishes. The city of Thunder Bay will be identified. The method of accessing the subjects must be mentioned. It will not be difficult for a reader to determine the Board's identity. However, the Separate School Board is also being approached. Therefore, the results will be applicable to children from both systems. At this point in time there is not anticipated need to compare children from the two systems. Should this need arise, the investigator agrees to consult the Supervisor of Research prior to submission of the final thesis.

12.4 Have you discussed with the superintendent responsible for research how the findings will be used?
No, but I would be willing to do so at any time.

13. Anticipated outputs of documentation. See 5.4

14. Attached Code of Ethics (see Appendix E)

Appendix E

CODE OF ETHICS

The researcher must abide by the following code of ethics:

1. The research procedure shall not be harmful in any way to the subject participating.
2. The researcher will be under the jurisdiction of the administration and the principal of the school selected for research in terms of his/her conduct while working in the school.
3. The data collected in the performance of the research will be kept in strict confidence. No names of persons tested, their test results, or the names of the teachers, principals, or schools, shall be mentioned or attention be unduly attracted to them during the course of or following research undertaken unless authorized by the administration. General or specific results as would be used for research papers for scientific journals will be accepted.
4. The researcher shall not, in any way, attempt to attract the interest of the media to his/her research unless authorized by the administration. If the researcher is contacted by representatives of the media, the researcher is bound to say nothing about the research unless the researcher has been given permission by the administration.
5. Research that is not supporting or facilitating the operation of the system is subject to the discretion of the administration and the school principal(s). If the administration and the principal refuse the use of school facilities to a researcher external to the system, the researcher must accept this decision.
6. In accordance with this research policy, any researcher that is undertaking research in this system that identifies the Lakehead Board in any manner, must obtain the approval of the administration for the use of the data.

Date: _____ Signature: _____

Submission to the
Lakehead District Catholic School Board

August 17, 1984

Sandra L. Summers
563 Fulton Blvd.
Thunder Bay, Ontario

Title of Research: The Relationship Between Life Change
and Health of Preschool Children

Name of Researcher: Sandra L. Summers

Position of
Researcher: Student, Masters of Nursing, University
of Manitoba, Winnipeg, Manitoba.

Name of Faculty
Advisor: Professor Susan Roe, School of Nursing,
University of Manitoba, Winnipeg,
Manitoba.

Date of Submission: August 17, 1984.

Place: Lakehead District Catholic School Board
212 Miles Street East
THUNDER BAY, Ontario
807-623-5581.

Address of
Researcher: 563 Fulton Blvd.
THUNDER BAY, Ontario
P7B 5W7
807-345-0363

Business Address
of Researcher: Lakehead University
School of Nursing
THUNDER BAY, Ontario
P7B 5E1
807-345-2121, Ext. 446.

Research Proposal

Purpose

Children, like all people, are exposed to changes in their lives. Whenever a child experiences change adjustment is required. Life changes affecting young children most often originate within the family.

Many studies have found significant positive correlations between clustering of life change events and the occurrence of illness in adult populations. Although some similar studies have been done with children and adolescents few investigations have been reported on preschool populations. Life Event Inventories for children and adolescents have been developed by Coddington. Paulucci utilized the tool for preschool children and found a significant correlation between life change events, health and development, and preschool children's performance. The variables health and development appear to be more appropriate in the study of the relationship of life change in the lives of young children than illness variables.

Health and development of children are of particular relevance to nurses who have been involved historically in promoting the health and development of children. Nurses participate in activities directed to the early identification of potential health problems in both healthy and high risk populations. To date these activities have been focused around health assessments which include physical examinations, developmental screening, history taking, and anticipatory guidance. With increasing awareness of the impact of rapid social change on the lives of children nurses require more knowledge, skill, and tools to help them meet the health needs of the young child. Early identification of potential problems in children exposed to such changes cannot be done without further study. Preliminary studies must be done to determine the relationship between life change events and the health of young children. This study will investigate the relationship between changes occurring in the lives of preschool children and their health.

Research Design

The design is exploratory-descriptive. Quantitative and qualitative data will be collected utilizing two existing instruments and a demographic questionnaire developed for this investigation. Few causal relationships

can be inferred from this design, however hypotheses may be generated from this preliminary study which can be tested in future investigations.

Methodology

Children in junior kindergarten classes will be provided with a letter (see Appendix A) to take home to their mother or primary caretaker. If the child's mother wishes to be involved in the study she will sign a consent form at the bottom of the letter and return the form with the child to school. After one to two weeks, the investigator will pick up the forms from each participating teacher. The forms will be coded so that the school cannot be identified. Geographical representation is desirable, therefore coding is necessary. Mothers will be contacted by telephone or letter to explain the purpose of the study and to arrange an interview if the mother agrees to continue. The interviewer (investigator or trained interviewer) will arrange a meeting of one to one and a half hours. The child does not have to be present. The mother will be asked to sign a consent to participate (see Appendix B) and then to complete two questionnaires (see Appendix C). The interviewer will then ask the mother the questions on the third instrument (see Appendix D). The instruments will be coded with a participant number. No identifying marks will be on the response sheets.

Method of Reporting Study

The student-investigator will prepare a Masters thesis for review by her thesis committee. It will then be submitted to oral examination and subsequently, in written format, to the University of Manitoba Library as well as to other libraries which are repositories for nursing research. A summary report will be available to the participants, both mothers and schools, if requested. The results of the study may be published in a journal at a later date.

Schools to be Contacted

All schools having junior kindergarten classes in the city of Thunder Bay are considered to be part of the target population.

Sample and Sample Size

A total sample of 60 mothers or primary caretakers are anticipated to be sufficient to demonstrate the direction of

the data. However, many more must be contacted in order to ensure this number of participants as well as some degree of geographic representation throughout the city.

Anticipated Date to Begin Study

The investigator expects to be ready to begin data collection by the end of September. The exact date depends of the date of final approval from the Ethical Review Committee, School of Nursing, University of Manitoba. The proposal will be submitted to this committee's first fall meeting.

Anticipated Involvement of Board Employees

The only anticipated involvement is for those teachers who teach junior kindergarten classes within the city. They would be asked to distribute the letter to each child and to collect the returned consents and place them in an envelope. The investigator or a delegate would pick up the returned forms directly from the teacher or the school.

Appendix H

Approval of School Boards: The Lakehead Board
of Education; and The Lakehead District
Catholic School Board Including
Code of Ethics and Policy Re: Research
Activities



DR. RILEY E. MOYNES
Director of Education

2135 SALLS STREET
Thunder Bay, Ontario P7E 5T2
Telephone 623-2122



I am pleased to inform you that your research project related to Relationships Between Life Changes and Health of Pre-School Children has been approved by the Superintendent responsible for research.

As we discussed, according to The Lakehead Board of Education's Research Policy, it is necessary for you to seek approval from the Principals of schools you have identified. I will forward a copy of your research application to them.

Best wishes for success in your research project. The Research Department would appreciate a copy of your final paper.

Sincerely,





**The Lakehead District
Roman Catholic Separate School Board**

G. S. O'BRIEN, B.A., M. ED.
DIRECTOR OF EDUCATION AND SECRETARY

EDUCATION CENTRE - 212 MILES STREET - THUNDER BAY, ONT. P7C 4Y5 - PHONE (807) 623-5581

August 20, 1984



Dear Ms. Summers:

With reference to your request to distribute letters to the parents of Junior Kindergarten students in this school system in conjunction with your research proposal "The Relationship Between Life Change and Health of Preschool Children", I am pleased to advise that approval is hereby granted.

You are requested to communicate with Mr. J. L. Squire, Superintendent of Education, to arrange a meeting in which you might discuss the requirements of this Board's research agreement. Mr. Squire has been given the responsibility of overseeing the conduct of this project.

Yours sincerely,



/tmh
cc: J.L. Squire



**The Lakehead District
Roman Catholic Separate School Board**

G. S. O'BRIEN, B.A., M. Ed.
DIRECTOR OF EDUCATION AND SECRETARY

EDUCATION CENTRE - 212 MILES STREET - THUNDER BAY, ONT. P7C 4Y5 - PHONE (807) 623-9581

C o d e o f E t h i c s

Research Project: The Relationship Between Life Change
and Health of Pre School Children

Researcher: Ms. Sandra Summers

1. The researcher conducting research within the jurisdiction of the Lakehead District Catholic School Board shall abide by the terms of Board Policy #904.
2. The research procedure shall not be harmful in any way to the subject participating in the research.
3. While conducting the research, the researcher will place herself under the jurisdiction of the Superintendent of Education, and of the Principal of the school selected for the research in terms of his conduct while working in the school.
4. The data collected in the performance of the research shall be kept in strictest confidence. No names of persons tested, the test results or the names of teachers, principals or schools shall be mentioned or attention be unduly attracted to them during the course of or following research undertaken. General or specific results as would be used for research papers or scientific journals are permissible.
5. The researcher shall not without specific approval of the Superintendent of Education attract the interest of the mass media to her research or discuss her research with representatives of the media in such a way as to identify the system, the school or the school personnel involved in the research.

I agree to abide by the terms of the Lakehead District Catholic School Board Policy #904 and the Code of Ethics as outlined above.

37

DATE November 15/84

The quality of this microfiche is heavily dependent upon the quality of the thesis submitted for microfilming.

Please refer to the National Library of Canada target (sheet 1, frame 2) entitled:

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage.

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THÈSES CANADIENNES

NOTICE

AVIS

POLICY: <u>RESEARCH ACTIVITIES</u>		904
SECTION: <u>900</u>	<u>School and Community Relations</u>	Page <u>1</u> of <u>3</u>
APPROVAL DATE: _____	EFFECTIVE DATE: _____	REVISION DATE: _____

A: POLICY:

- 1.1 The Board of Trustees recognizes the necessity and value of investigations, research and experimentation in the continuing effort to improve the quality of education.
- 1.2 Further, the Board acknowledges the importance of facilitating and assisting those persons engaged in research and in the pursuit of new knowledge, procedures and processes.
- 1.3 Therefore, the Board endorses the idea of research within this system when such is deemed appropriate and not disruptive to the normal operation of the system or school.

B: GUIDELINES:

2. All research and experimental projects which require the use or cooperation of school students, the use of facilities or system personnel are to be conducted in accordance with this policy.
3. "Research" is defined as any activity which requires the facilities or use of the student, teacher or administrative populations of the Lakehead District Catholic School System for the purposes of scientific studies, the collection of statistical data, surveys or questionnaires, or manipulation of variables, or for the purpose of using such populations thereof for practical field work or for the advancement of the training of university or college students.
4. Research may be carried out by members of the teaching staff, by teachers on leave, by members of a university or college faculty, by authorized undergraduate or graduate students, or by persons associated with educational groups or organizations external to this system.
5. Research may be conducted only with the approval of the Executive Council and the Principal of the school(s) involved.
6. All research requests are to be forwarded to the Director of Education and are to be accompanied by two (2) copies of the following documents:
 - 6.1 An official letter of introduction from the researcher's superior;
 - 6.2 A brief resume of the proposal outlining the purpose and nature of the proposed research including:
 - 6.2.1 the topic and purpose of study;
 - 6.2.2 the school, space or facilities required;
 - 6.2.3 the number, age and grade level of students required;
 - 6.2.4 dates and time required for testing of research;
 - 6.2.5 procedure or methodology for conducting the research, including a precise indication of the student's task.

POLICY: <u>RESEARCH ACTIVITIES</u>		# <u>904</u>
SECTION: <u>900</u>	<u>School and Community Relations</u>	Page <u>2</u> of <u>3</u>
APPROVAL DATE: _____	EFFECTIVE DATE: _____	REVISION DATE: _____

7. The Executive Council will review and assess the proposal in terms of appropriateness and timeliness. Should the proposed research be approved, a copy of the proposal will be forwarded to the Principal(s) in whose school(s) the research is to be undertaken and a supervisory officer will be designated to oversee the research project.
8. Final approval for the research project will be made by the school principal in conjunction with his staff, and he in turn will notify the designated supervisory officer of his decision.
9. Upon notification of approval of the proposed research, the supervisory officer will so inform the researcher(s) and request the latter to sign the Code of Ethics Form as presented in Appendix A.
10. No research activity is to commence until the Code of Ethics Form is completed by the researcher(s).
11. Researchers conducting research in school(s) are subject to the authority of the Principal of the school(s) or otherwise to the authority of the designated supervisory officer.
12. The supervisory officer or the School Principal may suspend or terminate a research activity where either feels the activity is being conducted in an unsatisfactory manner, or where the activity unduly disrupts the operation of a class, school or system or where the Code of Ethics has not been respected.
13. Researchers shall hold in strict confidence, all data collected and information as to its source. Strict anonymity of sources is to be preserved. Results of research may be released to scientific journals and to the school staff concerned and to the supervisory officer in the form of a research report without identification of school(s) or students involved in the research.

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Appendix I

Letters Introducing Research to Principals
From Senior Staff: The Lakehead Board
of Education (1); The Lakehead
District Catholic School Board (2)



DR. RILEY E. MOYNES
Director of Education

M E M O R A N D U M

2135 SILLS STREET
Thunder Bay, Ontario P7E 5T2
Telephone 623-2122

TO:

DATE: 1984 11 09

FROM:

RE: RESEARCH PROJECT BY SANDRA SUMMERS

A research project concerning Relationships Between Life Changes and Health of Pre-School Children has been approved by the Superintendent responsible for research. The project is being conducted by Sandra Summers, a Masters of Nursing student. Ms. Summers has been informed that the final approval rests with the Principal of the school concerned. Ms. Summers will be in touch with you shortly.

ej/11/m/rp/ss

"learning and growing together"



**The Lakehead District
Roman Catholic Separate School Board**

G. S. O'BRIEN, B.A., M. ED.
DIRECTOR OF EDUCATION AND SECRETARY

EDUCATION CENTRE — 212 MILES STREET — THUNDER BAY, ONT. P7C 4Y5 — PHONE (807) 623-5581

MEMORANDUM

TO PRINCIPALS OF SCHOOLS WITH J.K. PUPILS
FROM J. L. Squire
DATE November 19, 1984
SUBJECT APPROVED RESEARCH PROPOSAL

In accordance with the procedures outlined in Policy 904 'Research Activities', the Executive Council has approved the request of Ms. Sandra Summers to distribute letters to the parents of Junior Kindergarten students in this system. This activity is being carried out as part of Ms. Summers' research study entitled 'The Relationship Between Life Change and Health of Preschool Children'.

Ms. Summers should be contacting you in the very near future seeking your assistance. For your information, I have attached a copy of her research proposal. You will note that the time commitment of you and your Junior Kindergarten teacher is minimal.

I have been designated as the one responsible for overseeing this project, therefore, should you have any questions, please contact me.



**The Lakehead District
Roman Catholic Separate School Board**

G. S. O'BRIEN, B.A., M. Ed.
DIRECTOR OF EDUCATION AND SECRETARY

EDUCATION CENTRE — 212 MILES STREET — THUNDER BAY, ONT. P7C 4Y3 — PHONE (807) 623-5581

MEMORANDUM

TO PRINCIPALS OF SCHOOLS WITH J. K. PUPILS
FROM J. L. Squire
DATE December 17, 1984
SUBJECT MEMORANDUM OF NOVEMBER 19, 1984
- APPROVED RESEARCH PROPOSAL

In a memo dated November 19th entitled Approved Research Proposal, Principals with J.K. pupils were advised that the Executive Council had approved a request by Ms. Sandra Summers to carry out a Research Study entitled 'The Relationship Between Life Change and Health of Preschool Children'. Principals were advised that they would be contacted by Ms. Summers seeking their assistance in carrying out this study. It appears there has been some confusion in that some Principals sent out the parent letters prior to being contacted by Ms. Summers. It was not intended that this be done. If you have sent consent letters to parents prior to being contacted by Ms. Summers, please notify the undersigned as soon as possible.

Appendix J

Qualitative Data From the Life Event
Inventories

Qualitative Data Life Event Inventories

Identified to be Similar to Life Event #	# Responses	Item	Score	Adopted Score
1	1	Sibling Rivalry - with 14 month old	$50 \times 0.8 =$	40
	1	Difficulty with sibling	$50 \times 0.8 =$	40
	1	Children too close together: this child eldest of 3 and 4th child on the way	$50 \times 0.5 =$	25
	1	Beginning of pregnancy	$50 \times 0.25 =$	12.5
	1	Birth of a female cousin	$50 \times 0.75 =$	37.5
2	1	Engagement between mother and fiance broken	$27 \times 0.75 =$	20.25
3	1	Joined a youth group	$42 \times 0.5 =$	21
	1	Travels by school bus - first time	42	= 42
	1	Enrolled in Child Development Program	42	= 42
	1	Attended Day Care Nursery	42	= 42
4	1	Mother pregnant, miscarriage	52	= 52
7	2	Separation from close childhood friends	38	= 38
	1	Started taking dance classes	38	= 38

Identified to be Similar to Life Event #	# Responses	Item	Score	Adopted Score
8	1	Interviewed by Children's Aid Society re: possible sexual abuse by father	34	= 34
	1	Husband experience burnout effecting relationships between spouse and family	34	= 34
9	1	Full time at day care and junior kindergarten	33	= 33
10	1	Father's visits too infrequent	43	= 43
	1	Intermittent day- time incontinence	43	= 43
	1	Parents vacation without child	43	= 43
	2	Has babysitter every day	43	= 43
	1	Move to Thunder Bay; therefore, more shopping; more toys	43	= 43
11	1	Father at home taking care of child 5 months (job shares 5 months on, 5 months off)	39 x 0.75	= 30
	1	Father taking children on week- ends	39	= 39
	1	Father on shifts (midnights) - less time spent with child	39	= 39

Identified to be Similar to Life Event #	# Response	Item	Score	Adopted Score
	1	Change in father's job - <u>more</u> time spent at home	39	= 39
	1	Father taking job related courses in evenings - <u>less</u> time spent at home	39	= 39
12	1	Short but painful emergency - infected pierced ear	59	= 59
	1	Tests related to "squeaky heart"	59	= 59
	1	Contact with head lice	59 x 0.5	= 30
15	1	Grandfather jailed less than 30 days	67 x 0.63	= 42
16	1	Remarriage of grandmother	62 x 0.5	= 31
17	1	Change in baby- sitter due to illness	41	= 41
20	1	Discovering adopted siblings	33 x 0.6	= 20
22	1	Babysitting 3 other children, 8 a.m. - 6 p.m.	47	= 47
	1	Goes to baby- sitter 2 days/week	47 x 0.5	= 23
	1	Mother changed from part time employee to full time student and part time employee	47 x 0.5	= 23
	1	Mother started school	47	= 47

Identified to be Similar to Life Event #	# Responses	Item	Score	Adopted Score
24	1	Older child, hydrocephalic, hospitalized frequently (here and Toronto)	47 x 0.85 =	40
	1	Serious illness of close playmate	47 x 0.75 =	35
26	1	Separation from cousin to whom she became attached	39 x 0.5 =	20
	1	Grandparent leaving home	39 =	39
	1	Grandparents moved to Florida for 7 months	39 =	39
29	1	Trip to Denmark - child did not like not understanding language	35 =	35
	1	Major fire at home	35 =	35
	1	Living in hotels and with relatives x 6 weeks	35 =	35
	2	Moved to a different city	35 =	35
30	1	Wearing Thomas Splint at night	39 =	39
31	1	Learned to skate - very happy	34 x 0.5 =	17
	1	Promoted from junior kindergarten to senior kindergarten	34 =	34
	1	Vacation (camping) 2 weeks	34 =	34

Identified to be Similar to Life Events #	# Responses	Item	Score	Adopted Score
32	1	Separation from family pet	40	= 40
-	1	Attempted robbery at home--child started wetting bed		= 70
-	1	Father moved out, 1982--still stressed		0
-	1	Many things applied over past 2 years		0
-	1	Change of dancing school		0