FACTORS DETERMINING THE USAGE OF INFANT CAR SEATS BY MOTHERS IN THE KAISER PERMANENTE MEDICAL CARE PROGRAM

by

Sally Jo Guske, R.N., B.S.

A Thesis

Presented to
The University of Oregon Health Sciences Center
School of Nursing
in partial fulfillment
of the requirements for the degree of

Master of Nursing
June 8, 1980

APPROVED:

[redacted]

Julia S. Brown, Ph.D., Professor, Thesis Advisor

[redacted]

Wilma E. Peterson, Ph.D., Associate Professor, First Reader

[redacted]

Mary Ann Curry, D.N.Sc., Associate Professor, Second Reader

[redacted]

Carol A. Lindeman, Ph.D., Dean, School of Nursing

This study was supported by a traineeship from the United States Public Health Service Grant 5 Numbers ALL NU00250-03 and ALL NU00250-04.

ACKNOWLEDGEMENTS

I would like to express gratitude to the Kaiser Permanente Medical Care Program for granting me permission to pursue this study. Appreciation is extended to Merwyn R. Greenlick, Ph.D., Sara Lamb, Jeffry W. Bailey, Daniel Azevedo, Dan D. Purcell, John P. Mullooly, Ph.D., and the staff of the Kaiser Permanente Health Services Research Center who gave their time and knowledge in the counseling of this study. I am especially grateful to Wilma Peterson, Ph.D., and Mary Ann Curry, D.N.Sc. for their careful evaluation, and to Julia Brown, Ph.D. whose persistence made it all possible.

DEDICATION

to Vickie

for her love, support, and encouragement

that made it all worth while

TABLE OF CONTENTS

PAGE

LIST OF TABLES

CHAPTER I

INTRODUCTION

Automobile accidents are the leading cause of death among children over the age of one year (Hoekelman, 1978). Every year approximately 1,500 children, less than five years of age, are killed as passengers involved in motor vehicle accidents (National Safety Council, 1979). Thousands more children are injured as a result of automobile accidents (Vital Health Statistics, 1977). It has been shown that many of the deaths and injuries sustained during automobile accidents could have been prevented if the infants and children in crashes were restrained by seat belts alone, or with devices such as infant carriers or car seats that are specially designed to provide crash protection in motor vehicles (Henderson, Herbert, Stott, & Vazey, 1976).

Since 1964, seat belts have been standard equipment in cars. It is now mandatory that seat belts include shoulder straps. In a recent survey, visual observation of the occupants of 5,050 automobiles with at least one passenger under the age of ten, showed that 93% of the observed children were not restrained. It was also observed that of the children who were restrained, 73% were not restrained properly (Williams, 1976).

Perhaps the reason for the failure to restrain children properly lies in the fallacious beliefs of the general public, such as the idea that holding the baby in a person's arms is the safest form of transporting. It has been shown that this practice is very dangerous because the adult in the forward thrust of an automobile collision, may crush the child between the adult and the hard surfaces of the car interior (Neumann, Neumann, Cockrell & Banani, 1974). A second common

misconception is that seat belts can be used for infants and children under the age of four. Because of the body diemnsions and proportions of small children, seat belts cannot be fitted securely. The anterior superior iliac crests are less developed and do not allow the seat belt to be anchored properly. A small child's head mass is larger in proportion to body and extremity length, which makes for a higher center of gravity. In an accident the child leads with his head, causing more facial and head injuries (Charles, 1977).

Review of the Literature

The very limited research in the area of child passenger safety has focused mainly on three questions. What factors lead to the use or nonuse of child restraining devices in cars? How effective are health educational programs in crash protection for infants and children? What is the extent of use of car restraints for children?

Pless and Roghmann (1978) and Newmann et al. (1974) have addressed the first question, by examining the effects of selected social, demographic, and psychological characteristics of the family and mother on the use of car safety devices for children. Pless and Roghmann (1978) collected their data in 1969 by telephone interviews with a random sample of 318 families with children under 18 years of age, in Monroe County, New York. They found that education, family income and religion were significantly related to use of safety devices by children in cars. Parents with less education, lower incomes, and of the Catholic religion reported less frequent use of restraints. The mother's age was related only to use by children under 10 years of age, with older mothers being less likely to report the precautionary behavior. Use was also

less for children in families experiencing high "stress", such as chronic illness, unemployment, problems at work, trouble in school, marital discord and deaths.

Neumann et al. (1974) conducted their research on a sample of 198 families visiting a pediatric ambulatory clinic in Los Angeles. The sample was fairly representative of the larger community with regard to education, occupation, and ethnicity. Over half of the children in the study were under three years of age. Neumann et al. employed an interview schedule to elicit information on the knowledge, attitude and practice factors associated with the use of automobile safety devices. They concluded that children most likely to be using appropriate restraining devices were over six months in age, white, and had parents who had completed high school and who used seat belts themselves. Single parents were twice as likely as married parents to report no use of safety devices. Neumann et al. also found that use was not associated with the parent's knowledge about age-appropriate methods of child restraint, or with the family's accident history.

Finally, Neumann et al. (1974) tested the relation of a psychological trait, the "internal-external locus of control", to reported use of restraining devices for children. The locus of control refers to the individual's belief that outcomes in life are contingent on one's own behavior ("internal" control), or contingent on fate and on powerful individuals in the environment ("external" control). Using Rotter's (1966) Internal-External Locus of Control (I-E) Scale, Neumann et al. found that the more internal respondents were more likely than external respondents to report use of seat belts and restraining devices for themselves and for their children. A similar finding was obtained by Williams (1972).

It should be noted that the use of car restraints is one form of preventive health behavior. Previous studies have demonstrated that "internals" to a greater extent than "externals" take preventive actions such as contraceptive use and preventive dental care (Strickland, 1978). Previous studies have also demonstrated that a preventive health orientation is related to lesser likelihood of accidents, and greater use of car seat belts. Thus, Becker, Nathanson, Drachman and Kirscht (1977) reported that mothers who seek preventive care for their children believe they have active control over their own and their children's health. Further, these mothers bring their children to physicians for treatment of accidental injuries less frequently than do mothers with a weaker preventive orientation. Finally, Comstock and Helsing (1977) have produced evidence that persons who try to minimize other health risks through periodic dental checkups and physical examinations also use automobile seat belts more frequently. It may be argued, then, that internals appear to exhibit a preventive orientation, and to guard against illness and accidents to a greater extent than externals.

The second question regarding the effectiveness of health education programs for crash protection has commanded the attention of Allen and Bergman (1976), Kanthor (1976), Miller and Pless (1977), and Reisinger and Williams (1978). Allen and Bergman (1976) conducted an experimental study on a convenience sample of 202 women who delivered their infants at a prepaid health cooperative in the Seattle area. The women ranged in age from 15 to 40. They were predominantly primiparous, and most described themselves as housewives. The experimental study sought to assess the effectiveness of an instructional program on infant car seat usage. The instruction was provided on the post-partum ward. Three experimental

groups received different amounts of instruction. Group 1 was given descriptive literature on safety, Group 2 was given the literature and was shown a film, and Group 3 was given the literature, shown a film, and provided a demonstration on proper infant car seat use. A control group received no special instruction. The selected criterion for success of the program was purchase of a proper infant auto restraining device. Data including information regarding such purchases were gathered from mothers at the six-week post-partum visit. Allen and Bergman found that car seats had been purchased by 54% of the Group 1 mothers who had received the least amount of instruction, by 71% of the Group 2 mothers and 60% of the Group 3 mothers who had received the most instruction. By contrast, only 37% of the control group had purchased proper car seats. The authors concluded that instruction in infant safety was effective. They also noted that purchase of car seats was positively related to the social class position of the mother, and to her knowledge of auto safety, but not to family history of auto accidents.

In research conducted by Kanthor (1976), 16 mothers were given verbal instruction on infant car restraints during a 15-minute prenatal pediatric interview, while a control group of 19 mothers received no instruction. All mothers were members of a prepaid health plan in Rochester, New York. The sample consisted mainly of white, middle class women in their early twenties. When interviewed at their infants' six-week checkup, 69% of the counseled mothers versus 42% of the noncounseled mothers reported using safe infant restraint systems. Kanthor concluded that this method of counseling was effective.

In an experiment somewhat similar to that of Allen and Bergman (1976), Miller and Pless (1977) attempted to assess the relative effectiveness of

programs containing different amounts and types of instruction. Their sample was drawn from two pediatric group practices, and consisted of 654 parents who brought their child to the office for a well child check-up. Children ranged in age from under 1 year to 17 years. The majority of parents were from the middle and upper socioeconomic strata.

At the office visit, parents were questioned regarding their use of infant car restraints. Subsequently, one group of parents received no special instruction. The rest received one of three methods of instruction, specifically (1) pamphlet, (2) pamphlet plus verbal instruction, or (3) pamphlet, verbal instruction, and a brief slide-tape show. Two weeks following instruction, parents were contacted by telephone, mail or in person, and asked whether or not they had used a restraint for their child during their last car trip. Miller and Pless (1977) found no significant changes in behavior for any of the groups, although, interesting enough, the control group reported the greatest increase in use of restraints. This study, then, casts doubt on the effectiveness of health educational programs in promoting infant safety.

Finally, Reisinger and Williams (1978) conducted research on the post-partum unit of a women's hospital in Pittsburgh to evaluate three in-hospital educational programs designed to increase the use of infant restraining devices by mothers. Their sample consisted of 800 mothers, mainly in their mid twenties, and with an average education of 14 years. The programs consisted of (1) literature alone, (2) literature plus a personal discussion, and (3) literature plus the offer of a free infant car seat. A control group received no instruction. For all groups, infant car seats were readily available for purchase from the hospital pharmacy. Data were collected by direct observation, at time of the

infant's discharge from the hospital, and two to four months later when the infants returned to the hospital for participation in another study. The researchers found that the programs had increased the extent to which infant carriers were used to transport babies in cars but had little or no effect on the key outcome measure, which was the fastening of the infant carrier by the car seat belt so that crash protection is provided. Safe use was low in all groups. The most common mode of travel for babies was in someone's arms, regardless of the educational approach.

The different conclusions reached by the investigators of the four aforementioned studies indicate that the educational programs used to date to promote car safety for infants have not been clearly effective. Programs conducted in the prenatal or post-partum periods appear somewhat more effective than programs conducted in pediatric clinics. More needs to be learned, then, regarding the optimal timing of instruction. More needs to be learned, also, regarding which components of these programs are more, and which are less effective.

With regard to the last question, "What is the extent of use of child restraints?" again no clear answer is available. The results of the existing research by Williams (1976), and by Miller and Pless (1977) are discrepant. Williams (1976) made visual observations on the use of restraints by occupants of 5,050 automobiles, with at least one passenger under 10 years of age. He also conducted short interviews with the drivers of the cars. These data were collected at 14 amusement areas and shopping centers. Of the 8,893 children on whom information concerning restraints was obtained, 93% were not restrained. Sixteen per cent of child restraining devices observed in the cars were not being used, and of those in use, 73% were not used correctly. Williams noted that the use

of restraining devices declined sharply after the age of one year, and the reason most often given was physical resistance to restraint on the part of the child.

Miller and Pless (1977) have reported the results of two pilot studies involving observations of the use of child restraints. In the first study, 454 cars in a parking lot adjacent to a pediatrician's office were observed over a six-day period. Of the 729 child passengers, 19% were restrained. Use of restraints was greater for infants than older children. In a second study, two years later, 71% of the children arriving on a single day at the pediatrician's office were observed to be using restraints. Questionnaires obtained over a 10-day period which included the day of observation revealed that 69% of the parents claimed they had restrained their children during travel to the pediatrician's office. Miller and Pless concluded both that the use of restraints may have increased over recent years, and that parents appear to respond truthfully when asked about the use of restraints.

This last finding is of interest in light of the criticism which has been leveled in the past against studies of safe car seat use which rely on parents' verbal reports for data, rather than on observations. It has generally been assumed that parents will exaggerate actual use, perhaps to appear in a favorable light to the investigator (Reisinger & Williams, 1978). However, the results of Miller and Pless suggest that this overestimation may not be as great as commonly feared, and that self-reports may still be a useful method of collecting data.

In summary, the review of the literature suggests that child safety devices in cars are used properly more frequently with children under the age of one year, and with children whose parents are better educated, more

affluent, and married. There is some evidence, also, that mothers who believe in an internal locus of control may use infant car restraining devices safely more than mothers who believe in an external locus of control. The existing research indicates that instructing parents in car safety may have some effect on usage, but estimates of the extent differ considerably. Doctors and nurses are in excellent positions to teach automobile safety to parents, but, according to one estimate, only 10% of the practicing pediatricians offer injury control programs as an integral part of their services (Low, 1977). Further research needs to be completed in the area of education regarding car safety in order to identify factors that may increase infant car seat usage.

Purpose of the Study

From the review of the literature, it appeared that car safety for children was an area where further research was required. The literature also suggested that the mother's belief in locus of control regarding health might be a significant factor in affecting infant car seat usage. With these considerations in mind, the purpose of this investigation was to assess both the effects of instruction in infant car safety, and the effects of the mother's locus of control on safe usage of infant car seats as determined from the mothers' reports. In this study, locus of control was measured by the Multidimensional Health Locus of Control (MHLC) Scale developed by Wallston, Wallston and DeVellis (1978) to provide a measure basically similar to Rotter's I-E Scale (1966), but less generalized and more health specific in focus. Rotter (1975, p. 59) recognized the value of such specific expectancy measures "if one's interest is in a limited area and particularly if one is seeking some

specific practical application where every increment in prediction is important".

Hypotheses

It was hypothesized that:

1. Mothers with more exposure to infant car safety instruction tend to report safe infant car seat usage more frequently than mothers with less exposure to infant car safety instruction.
2. Mothers with a greater internal health locus of control tend to report safe car seat usage more frequently than mothers with a greater external health locus of control.
3. Mothers who used safety restraining devices for themselves tend to report safe usage of infant car seats more frequently than mothers who do not use safety restraining devices for themselves.

CHAPTER II

METHODS

Subjects and Setting

This study was conducted through the Kaiser Permanente Medical Care Program. Kaiser is a Health Maintenance Organization based on five principles including voluntary enrollment, prepayment of comprehensive benefits on a service basis, preventive medical care, integrated hospital-based health care facilities, and provision of physician services through group medical practice. The program in Portland enrolls approximately 200,000 members, or about 20% of the population of the Portland metropolitan area. Clients represent a cross section of the population in terms of socio-economic status, with many members receiving Kaiser group health coverage through their place of employment.

Kaiser provides instruction regarding transportation of children in automobiles as part of its preventive health program. To assess the effect of car safety instruction on reported use of child car seats, a convenience sample was drawn consisting of all mothers who had delivered live infants from July 1, 1979, to August 31, 1979, and who met the following criteria:

1. Had delivered a live infant at Bess Kaiser Hospital five to six months prior to the study (7/1/79 - 8/31/79).
2. Had a current health plan number with membership in her own name or that of her spouse, and was listed in the current files.
3. Infant was currently (January, 1980) listed as an active health plan member. The purpose of this criterion was to eliminate mothers from the sample whose infants had died or been given

up for adoption.

4. Owned a car or had a car available in which the infant was transported.

Data Collection Procedures

The director of Kaiser Permanente Health Services Research Center was contacted for permission to conduct the study. The names of mothers delivering live births during the stated months were obtained from the Kaiser data bank in accordance with the selection criteria. Mothers who delivered five to six months prior to the study were chosen for two reasons. First, it has been shown that the greatest lack of knowledge and use of appropriate child safety devices appears in relation to the 0-6 month old age group (Neumann et al., 1974). Second, by 5 to 6 months, the child is much more advanced in motor development and therefore, the use of the restraining device may appear more necessary to the mother.

Mothers were mailed the questionnaire, the MHLC, and a stamped pre-addressed return envelope. They were requested to complete and return the questionnaire as soon as possible. Subjects who did not return the original questionnaire within two weeks were mailed a second one. All mailings were sent from and returned to the investigator at the University of Oregon Health Sciences Center School of Nursing.

The questionnaire was accompanied by a letter of explanation regarding the study. (See Appendix D). Mothers were instructed that all information was confidential, and that failure to participate in the study would not affect the mother's or child's relationship with Kaiser. The returned completed questionnaire served as the consent form.

Data

By means of a questionnaire, data were obtained from the mothers of this sample regarding their use of restraining devices in cars for themselves and their infants, the amount of their exposure to the Kaiser instruction program on infant car seat safety, and their perceptions of control over their health. Information about selected background characteristics of the mothers was also sought. The complete questionnaire is reproduced in Appendix C.

Measurement of the Independent Variables

The independent variables in this ex post facto study were, (1) the amount of exposure to the safety instruction program, and (2) the mother's perception of the locus of control over her health, whether internal or external.

Amount of Exposure to Instruction

For the past seven years, Kaiser has used a multi-approach program of safety instruction dealing with mothers prenatally and postnatally. During 1978, 3,300 mothers delivered at Bess Kaiser Hospital. Of these mothers, 40% attended prenatal classes at Kaiser. Six prenatal sessions were provided. During one of the sessions, infant car safety and proper seat usage were discussed for approximately 15 to 20 minutes. There is no set protocol for the instructors regarding car safety, but the following points are always included in the discussion:

1. Holding a child in an adult's arms while traveling in a car is not a safe way to transport a child.
2. Seat belts should not be used on children under forty pounds because of their body build.

3. Bassinets and infant beds are not safe methods of transporting children in cars.
4. Infant car seats need to be tethered or fastened by a seat belt to be effective.

Prospective parents attending prenatal classes are informed that two car seats are approved by Kaiser's pediatricians, and are available for purchasing through Kaiser pharmacies at cost. The two car seats are the GM Love Seat and the Century Trav-L-Guard. Also during the prenatal classes, parents see the film produced by Physicians for Automotive Safety entitled "A Safe Ride for Every Child". (Note, 1) The film serves as a model, showing parents the proper use of infant car restraints. The film shows, (1) what happens to children during an automobile accident, (2) a mother putting an infant into an approved infant car seat, and (3) properly fastening the seat in the car. The film also discusses the four points regarding car safety as listed above.

Prior to dismissal from the post-partum ward, mothers receive instruction regarding infant car safety. Until July 1979, this instruction was provided by a pediatric nurse practitioner but is presently provided by a child health educator. During the dismissal talk the mothers are asked if they own an infant car seat. They are also told that Kaiser sells approved car seats at cost. The mothers are instructed that the carrying of an infant in the arms of an adult while traveling in a car is unsafe and that bassinets and infant carriers are also unsafe for transporting infants. The mothers then receive a handout entitled "Automobile Safety Restraints for Infants and Small Children". (Appendix A). This sheet shows pictures of the proper use of car seats, and lists places where new and used seats can be purchased. The sheet also provides

a list of do's and don'ts on auto safety including the information that seat belts should not be used on children under forty pounds and that car seats must be used properly to provide protection to the child. These instructions are provided Monday through Saturday. The instructions are not usually documented on the patient's chart.

Each Friday, a hospital volunteer visits the post-partum ward and shows one of the films: "A Safe Ride for Every Child" or "Don't Risk Your Child's Life", both produced by Physicians for Automotive Safety. The film is shown to mothers who did not see the films in the prenatal classes and to those who wish to see it a second time. The film "Don't Risk Your Child's Life" presents the same points listed above regarding proper use of restraints. It also describes different types of car seats, demonstrating how each is used properly. It is not documented on the charts whether or not patients are visited by the volunteer. Since 7/1/79, mothers who do not own a car seat but who are interested in purchasing one are encouraged to do so by receiving prescriptions for car seats when they are instructed prior to dismissal.

Degree of exposure to this program was measured and scored in the following way:

1.	No instruction	0
2.	Instructed prenatally or postnatally or saw the film	1
3.	Instructed prenatally or postnatally and saw the film	2
4.	Instructed prenatally and postnatally and saw the film	3

Questionnaire items 11, 12 and 14 provided the data for determining the mother's scores.

Health Locus of Control

Internal-external locus of control, representing a psychological trait, measures the extent to which the individual believes events in his or her life are influenced by his or her own actions (internal) or are the results of forces outside of himself or herself (external). The Multidimensional Health Locus of Control scales (MHLC) developed by Wallston et al. (1978) were used in this study. (See Appendix B for a copy of the instrument).

The MHLC scales were selected in preference to Rotter's (1966) Internal-External Locus of Control (I-E) Scale, since they are area-specific measures, rather than measures of generalized expectancies. It is assumed that health-related locus of control scales would provide more sensitive predictions concerning the relation between internality and health-related behaviors. Rotter (1975) has recognized the value of such area-specific measures for predicting behaviors in specific situations.

The MHLC scales were developed to tap beliefs that the source of reinforcements for health-related behaviors is primarily internal, under the control of powerful others, or a matter of chance. The three dimensions of health locus of control beliefs are reflected in the three scales, internality (IHLC), powerful others (PHLC), and chance (CHLC). Each scale consists of six items, and each uses a 6-point Likert format, ranging from strongly disagree (1), to strongly agree (6). The score on each scale can range from 6 to 36. The higher the score, the more the person exhibits that psychological trait, i.e., belief in internality, belief in control by powerful others, and belief in control by chance factors.

Internality (IHLC) represents the extent to which a person feels he or she has control over his or her health. The scales consists of the following six items:

1. If I get sick, it is my own behavior which determines how soon I get well again.
2. I am in control of my health.
3. When I get sick I am to blame.
4. The main thing which affects my health is what I myself do.
5. If I take care of myself, I can avoid illness.
6. If I take the right actions, I can stay healthy.

Powerful others (PHLC) refers to the psychological belief that other people have the control over one's health. This scale consists of the following six items:

1. Having regular contact with my physician is the best way for me to avoid illness.
2. Whenever I don't feel well, I should consult a medically trained professional.
3. My family has a lot to do with my becoming sick or staying healthy.
4. Health professionals control my health.
5. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.
6. Regarding my health, I can only do what my doctor tells me to do.

Chance (CHLC) refers to the belief that a person has no control over his health and is controlled by fate. The scale consists of the following six items:

1. No matter what I do, if I am going to get sick, I will get sick.
2. Most things that affect my health happen to me by accidents.

3. Luck plays a big part in determining how soon I will recover from an illness.

4. My good health is largely a matter of good fortune.

5. No matter what I do, I'm likely to get sick.

6. If it's meant to be, I will stay healthy.

Wallston et al. (1978) reported that the alpha reliabilities for the three MHLC scales ranged from .673 to .767. They also claimed some initial construct validity for the MHLC due to positive correlations of the MHLC scales with the corresponding subdimensions of internal-external locus of control identified by Levenson (1974), namely, internality (I), powerful others (P) and chance (C). The correlation coefficients were .57 between the IHLC and Levenson's I Scale, .28 between the PHLC and Levenson's P Scale, and .80 between the CHLC and Levenson's C Scale. Correlations between the MHLC scales and Rotter's I-E scale are not reported.

Wallston et al. (1978, p. 167) provided some evidence of the predictive validity of the MHLC. "As an initial indication of predictive validity, correlations were computed between health status and the MHLC scores. As expected, health status correlated positively with IHLC ($r = .403$, $p < .001$), negatively with CHLC ($r = -.275$, $p < .01$), and did not correlate with PHLC ($r = -.055$)." They concluded that the extent of validity and reliability of these instruments cannot be fully known until they have been appropriately used in a number of studies.

Measurement of the Dependent Variable

The dependent variable in this study was the safe/unsafe usage of infant car restraints for their children, as reported by mothers. A series of questions was used to assess safe usage of infant car restraints.

(See Appendix C). Questions 18-22 were used to determine if mothers used infant restraining devices properly. Responses were scored as safe or unsafe. The safe method of transporting was defined as, (1) use of an approved car seat, (2) proper securing of the car seat, (3) placing the seat in the proper direction, and (4) using the seat the last time the baby was transported in the car. Unsafe was defined as any method of transporting the infant that failed to include any of the four proceding techniques.

Additional Data

Additional information was collected by means of the questionnaire for descriptive purposes, and to compare the present sample with samples in similar investigations. (See Appendix C for copy of questionnaire). The mother's age, parity, marital status, education, income and occupation were assessed. Data were also gathered regarding whether or not the mother attended prenatal classes, how many classes, whether she saw the car safety film, and whether she received safety instruction prior to hospital dismissal. It was also determined whether the mother used safety restraints herself, and had been involved in an automobile accident.

Analysis of Data

Items 1-8 and 17 were used to describe the sample, permit its comparison with other samples, past and future, and to determine if the infant met the selection criteria for the study. Items 4-8 were used to assess the subjects' socio-economic status according to the Duncan-Reiss Socioeconomic Index (Reiss, Duncan, Hatt, & North, 1961). Items 9-16 provided information on the frequency with which mothers were exposed to infant car safety instruction, and where they were instructed.

Responses to items 18-22 permitted determination of safe versus unsafe usage of infant car restraints. From question 23 an estimate was obtained of consistency of usage of infant car restraints. Finally, questions 24-28 yielded the data by which to compare the results of this study with those of previous studies which showed that use of infant car seats is associated with the use of restraints by the parents.

Bivariate analysis was used in testing the first hypothesis that an association exists between safe/unsafe usage of infant car seats and exposure to instruction. The chi square statistic was used to determine significance of the relationship. Bivariate analysis was also used to test the second hypothesis that safe usage of car seats is related to the mother's perception of health locus of control. For each subdimension of the MHLC, scores were dichotomized at the median to differentiate internals from externals. A two by two contingency table was constructed for each subdimension, and a median chi square test used to test the relationship.

On the basis of their responses to question 26, mothers were dichotomized into those who use and those who do not use seat belts, and then a two by two contingency table was constructed. The chi square test was applied to determine the significance of the relation between mother's seat belt usage and their safe/usage use of infant car seats. An additional check for the third hypothesis was the use of responses to questions 23 and 25 regarding the percentage of time the mothers used car seats and seat belts. These data were correlated by the use of Pearson's r.

CHAPTER III

RESULTS AND DISCUSSION

Description of Sample

A total of 346 subjects met the criteria for inclusion in this survey. Questionnaires were mailed to these women in January 1980, requesting their participation in the study. Two weeks later, followup letters and questionnaires were sent to those failing to respond to the first request. In all, 212 questionnaires were returned (61.3%), and of these, 207 were complete and usable.

Selected characteristics of the respondents are presented in Table 1. The mean age was 27.6 years, and the majority of the women were in their twenties. Ages ranged from 19 to 39. The absence of mothers under 19 may be due to the selection procedure whereby mothers who delivered under their parents' membership in the Kaiser plan and mothers whose infants were not listed as health plan members, were excluded from the sample. The reason for the absence of any mothers over the age of 39 is not clear. Possibly, some women may have claimed to be younger than they actually were. Selltiz, Wrightsman and Cook (1976) have cautioned researchers that a tendency exists among the American public to respond to questions about age by reducing actual age. Also, it is possible that no women in the sample were over 40 years of age. The median age of mothers at birth of their last child is currently 31.2 years. Mothers are completing their childbearing at an earlier age than formerly, and the proportion of children born to women late in their reproductive cycle has continued to decline over this century (Glick, 1977).

TABLE 1

Selected Characteristics of Study Sample of Mothers From Kaiser Permanente Medical Care Program (N-207)

Mothers' Characteristics	Value	
Age [a]		
Mean	27.59	
Standard Deviation	4.49	
Range	19-39	
Education		
Mean	13.73	
Standard Deviation	2.06	
Range	9-17	
Socioeconomic Status [b]		
Mean	50.37	
Standard Deviation	23.09	
Range	7-93	
Income [c]		
Under $5,000	4	(1.9%)
$5,000-9,999	14	(6.8%)
$10,000-14,999	34	(16.4%)
$15,000-19,999	60	(29.0%)
$20,000-24,999	42	(20.3%)
$25,000-29,999	19	(9.2%)
$30,000+	24	(11.6%)
No data	10	(4.8%)
Marital Status		
Married or Living with Partner	199	(96.1%)
Single, Divorced, Widowed, etc.	7	(3.4%)
No Data	1	(.5%)
Parity		
Multiparous	140	(67.6%)
Primiparous	61	(30.4%)
No Data	4	(1.9%)
Employment Status		
Yes	73	(35.3%)
No	133	(64.2%)
No Data	1	(.5%)

[a] Mean based on N=205
[b] Duncan-Reiss Socioeconomic Index was used.
[c] Median income was $18,833

The majority (96.1%) of the mothers were married, or living with their partners. For most mothers (67.6%), their current infant was not the first child. Finally, 64% were not currently employed outside the home. These statistics suggest a relatively stable and conventional family life.

The socioeconomic status of the subjects ranged from very low to very high. The mean level of education was 13.7 years. Mean score on the Duncan-Reiss Socioeconomic Index (calculated on the basis of the occupation of either the husband or wife, whichever was highest) was 50.3, about on a par with the scores for skilled workers. However, scores on this Index were quite normally distributed throughout the entire range, from unskilled occupations to the professions. With respect to family income, again the range was from the poverty level to relative affluence. The median family income for the past year fell in the $15-19,999 bracket. Income was therefore, roughly equivalent to that of the average U.S. family (Statistical Abstract of the U.S., 1977). In conclusion, the sample may be described as comprised predominantely of stable families from middle and working class backgrounds. Because of the nature of the sample, the results of this study should probably not be generalized beyond this group to mothers of low income, poor education, or low occupational status.

Descriptive Findings Regarding Major Variables

Exposure to Instruction

The extent of mother's exposure to instruction on infant car safety through the Kaiser health system was measured on a scale from 0 to 3. A score of 0 represented absence of instruction either prenatally or during

TABLE 2

Type of Instruction in Infant Car Seat Safety of Study Mothers in the Kaiser Permanente Medical Care Program (N=207)

Exposure to Instruction	Mothers Receiving Instruction Numbers	Percent
Attended Prenatal Classes	147	(71.0%)
Prenatal Instruction		
Car Safety Discussed	100	(48.3%)[a]
Film Viewed	66	(31.9%)[a]
Instruction in Hospital		
Car Safety Discussed	141	(68.1%)
Film Viewed	25	(12.1%)
Total Never Viewing Film [b]	108	(52.2%)
Total Receiving No Instruction	31	(15.0%)

[a] This percentage was computed on the basis of number of respondents (207). On the basis of number of mothers attending prenatal classes (147), 68.0% discussed car safety and 44.9% viewed the film.

[b] No data were available for eight mothers, hence the percentages of mothers viewing the film and mothers not viewing the film do not total 100%.

hospitalization for delivery. A score of 3 signified that the mother had been instructed verbally in safety matters both prenatally and during hospitalization, and had also viewed a film on the subject on one or more occasions. From Table 2, it may be seen that 100 mothers (48.3%) reported discussing infant car safety during the prenatal classes, and 66 (31.9%) reported seeing a film on the subject in those classes. During the post-partum hospitalization, 141 (68.1%) claimed to have received instruction on infant safety, and 12.1% had viewed the film.

It is clear that prenatal clinics are reaching only about half of the mothers (100) with the content on infant car seat safety. About the same number of mothers (141 or 68.1%) received verbal instruction during hospitalization following delivery, and 25 or 12.1% saw the film on safety. For the total sample, 52.2% explicitly denied viewing the film, and 31 mothers (15%) denied ever receiving any instruction, before their infant's birth or during their hospital stay.

A number of mothers reported learning about infant car safety at a later date, or from sources other than Kaiser. The most frequently reported source of information was the media, including television, magazines and newspapers (70 mothers). Next most frequently mentioned were clinic and health professionals, such as doctors and nurses (37). The third category included friends, neighbors and relatives (29), and the fourth category included miscellaneous sources such as church, work, college, and organizations (23). Only eight mothers stated that they had received no information, either at Kaiser or in the community; however, 6 of these 8 used car seats regularly and correctly for their infants. It is speculated these mothers may have learned the proper use from the directions provided with the seats.

Safe/Unsafe Car Seat Usage

Safe usage of car seats was defined on the basis of four criteria: (1) use of an approved brand of car seat; (2) proper securing of the seat; (3) placement of the seat in the proper direction; and (4) use of the car seat on the last occasion on which the baby rode in the car. From Table 3, it can be seen that 163 (78.7%) of the mothers reported using the seats safely, and 44 (21.3%) did not. Of these 44 mothers, 8 did not own a car seat, 2 owned brands which were not approved and 9 failed to secure the car seat properly. The remaining 27 admitted they had not used the car seat during the last trip. It would seem that mothers for the most part own the proper equipment and know how to use it safely, yet may neglect on occasion to put this knowledge into practice. Perhaps further emphasis should be placed on the necessity of using car seats on every trip, no matter how short, because the majority of automobile accidents happen within a 25-mile radius of home (Neumann et al., 1974).

Mothers, on the whole, claimed to be consistent and faithful in the use of the car seats. Responses to the question regarding percentage of time car seats were used were highly skewed. Fifty-three per cent of the mothers claimed to use the devices 100% of the time, and only 7% admitted they used the seats 10% of the time or less.

It is possible that safe usage has been overestimated by the present study. For young infants, car seats should be positioned so that they face the back of the car. For older infants who are starting to sit up, the seats are faced forwards. The questionnaires were unfortunately sent during a period of transition when parents were beginning to change seat positions. Hence, forward as well as backward positioning was

TABLE 3

Safe/Unsafe Infant Car Seat Usage by Study Mothers

in the Kaiser Permanente Medical Care Program (N=207)

Elements of Safe/Unsafe Infant Car Seat Usage	Mothers Reporting Number	Percent
Owned Car Seat		
Yes	199	(96.1%)
No	8	(3.9%)
Owned Approved Brand		
Yes	177	(85.5%)
No	2	(1.0%)
No Data	20	(9.7%)
Car Seat Properly Secured		
Yes	186	(89.9%)
No	9	(4.3%)
No Data	12	(5.8%)
Used on the Last Trip		
Yes	180	(87.0%)
No	27	(13.0%)
Safe Usage	163	(78.7%)
Unsafe Usage	44	(21.3%)

considered correct for purposes of this study. It is possible that some mothers had been permitting the infants to face forward during their earlier months, an unsafe practice, but this possibility cannot be checked by the present data. In a future study, it is suggested that questionnaires be sent when infants are somewhat younger, as from 2 to 4 months old.

Health Locus of Control

As stated previously, the Wallstons' Multidimensional Health Locus of Control Scale (MHLC) was used to assess the mother's internality or externality. The tool consisted of three dimensions, "internality", "powerful others", and "chance". "Internality" measures the extent to which a person feels he or she has control over his or her health. As seen in Table 4, the mean score on this dimension (IHLC) was 27.44. Though there was a broad range (11-36), most scores were clustered toward the high end of the continuum, with the majority of subjects tending toward internality. While Wallston et al. (1978) provide no norms by which the scores of the present sample may be rated, it may be noted that the mean score of this sample is quite close to the mean score of 25.10 obtained by Wallston et al. for a heterogeneous sample of 115 persons of both sexes, waiting at a metropolitan airport. That sample was similar to this sample of mothers, in that the majority of the respondents had some college education, but dissimilar in being older (mean age of 42) and consisting 49% of males.

The second dimension is "powerful others" which refers to the psychological belief that other people have control over one's health. The mean score for this dimension (PHLC) was 15.43, and the range was 6 to 34. Apparently these mothers had only a moderate belief in external control

TABLE 4

Multidimensional Health Locus of Control: Mean Scores, Standard Deviations and Intercorrelations

Subscale	Mean	S.D.	Range	Intercorrelations (r) PHLC	CHLC
IHLC	27.44	3.58	11-36	.15	-.07
PHLC	15.43	5.53	6-34		.23*
CHLC	15.48	4.86	6-31		

*$p < .01$

by powerful others such as doctors and health professionals. Their mean score was somewhat lower than the 19.99 mean score reported by Wallston et al. (1978) for their sample. On the third dimension of chance, (CHLC), the mean score of this sample was 15.48 and the range was 6 to 31. For the most part, the mothers of this sample expressed a moderate belief that their health was the result of chance or fate. Their mean score was almost identical with that reported by Wallston et al. for their sample (mean score of 15.58).

Table 4 presents the intercorrelations among the various MHLC scales. Only one correlation reached statistical significance (that between the PHLC and CHLC) and all are low. These results lend credence to the view that the three dimensions are indeed distinct. Apparently it is possible for mothers to believe they have control over their health, and simultaneously believe that powerful others and or fate may have control as well. Likewise it is possible for mothers to believe they lack control over their health, and simultaneously believe that powerful others and fate also have little to do with their health.

Past Accidents

A question of interest to this research was whether past involvement in an automobile accident influenced the mothers' use of restraining devices. Of the mothers responding to the question, 53% stated they had been involved in an accident, and of these only 38.7% stated that the accident had influenced their use of restraints. It may be noted that Neumann et al. (1974) also found that previous experiences with accidents was not associated with use of auto safety devices.

Findings Related to Hypotheses

Hypothesis 1. Mothers with more exposure to infant car safety

instruction tend to report safe infant car seat usage more frequently than mothers with less exposure to infant car safety instruction.

Data indicating the relation between exposure to instruction and safe/unsafe use of infant car seats are presented in Table 5. It may be noted that as amount of instruction increased, the per cent of mothers who reported safe use increased from 67.7% to 94.1%. The differences among the groups of mothers with varying degrees of instruction are statistically significant (χ^2=10.56, df=3, p.$>$.02, C=72). The hypothesis is supported.

These findings are in accord with those obtained by Allen and Bergman (1976) and by Kanthor (1976), who reported that experimental groups of mothers receiving safety education subsequently used car seats to a greater extent than did control groups. Perhaps the reason for the similarity of the results is the similarity of the samples. In all three studies the subjects were members of pre-paid health plans, and predominantly middle class women in their mid-twenties.

It should be noted that the findings of the present study do not agree with those of Miller and Pless (1977) or those of Reisinger and Williams (1978) who reported that infant car safety instruction had little effect on safe use of restraints. One possible explanation for the discrepancy may lie in the nature of the samples. The sample of women studied by Reisinger and Williams (1978) included larger proportions of mothers from categories unlikely to use safety restraints for their children, namely, poorly educated women, single parents, and mothers from the lowest income groups. Moreover, the children involved were older than the infants of the present investigation. The sample of

TABLE 5

Relation of Mother's Exposure to Instruction to Safe/Unsafe Infant Car Seat Usage (N=207)

Degree of Exposure to Instruction	Number of Mothers with Safe Usage	Unsafe Usage	Total	Percent Safe
0	21	10	31	67.7%
1	53	19	72	73.6%
2	41	12	53	77.4%
3	48	3	51	94.1%
Total	163	44	207	78.7%

χ^2=10.56, df=3, $p < .02$: Contingency Coefficient C=.72

mothers studied by Miller and Pless (1977) was quite similar to the sample of mothers in the present investigation, but the children were older. The mean age of the children was four years, and ages ranged from infancy to 17 years. It has been shown that use of car restraints falls off following one year of age, because children physically resist being placed in the restraining devices (Williams, 1976).

A second possible explanation for the discrepancy between the findings of the present study and that of Reisinger and Williams (1978) may lie in the method of data-collection. In this study, a mailed questionnaire requested self-reports on usage. Reisinger and Williams gathered their data by direct observation.

Hypothesis 2. Mothers with a greater belief in internal health locus of control tend to report safe car seat usage more frequently than mothers with a greater belief in external health locus of control.

In testing this hypothesis, the sample was dichotomized into mothers with higher scores on each subscale of the MHLC, and mothers with lower scores. This was accomplished by a median split. Table 6 presents the frequencies which resulted when mothers were crossclassified by their locus of control and by their safe/unsafe use of infant car seats. According to the chi-square median test, none of the relationships were statistically significant at the .05 level or below. The mothers who believed their health was determined mainly by powerful others were just as likely to manifest safe practices as the mothers who did not believe in external control by powerful others (χ^2=.13). Mothers who believed in control by fate and chance were just as likely to use the car seat properly for their infants as mothers who did not so believe (χ^2= .82). Again, those mothers tending to internality were no more likely than those tending to external-

TABLE 6

Relation of Multidimensional Health Locus of Control (MHLC)

To Safe/Unsafe Infant Car Seat Usage (N=198)[a]

Infant Car Seat Usage	MHLC Scores: Below Median	Above Median	Chi-Square Value
	Internality		
Safe	72	85	2.40 n.s*
Unsafe	25	16	
	Powerful Others		
Safe	73	84	.13 n.s.
Unsafe	21	20	
	Chance		
Safe	80	77	.82 n.s.
Unsafe	17	24	

[a] Data on MHLC were missing for 9 subjects

* n.s. = nonsignificant

ity to use car seats safely (χ^2=2.40). In view of these results, Hypothesis 2 was not accepted.

These results disagree with the findings of Neumann et al. (1974) and of Williams (1972) who found that internality was related to the use of restraints for parents and their children when riding in automobiles. One reason for the discrepancy may be that the latter authors used Rotter's I-E scale (1966), rather than the MHLC. It would seem logical, however, that a locus of control scale specifically designed for health issues would be more valid and useful in explaining preventive health behaviors. And indeed, Wallston and Wallston (1978) have published data supporting the existence of a relation between certain preventive health behaviors and their measure. On the other hand, McCusker and Morrow (1979) could find no relation between the health locus of control measure and preventive behaviors with respect to cancer. Clearly the reliability and validity of the MHLC Scale need further assessment.

Hypothesis 3. Mothers who use restraining devices for themselves when riding in cars tend to report safe usage of infant car seats more frequently than mothers who do not use safety restraining devices for themselves.

For the purpose of testing this hypothesis, safe usage on the part of the mother was inferred from an affirmative answer to the question "Did you use seat belts yourself the last time you rode in a car?". In Table 7, the responses of mothers to this question are crossclassified with scores (safe/unsafe) concerning their infants' safety. The relation between the two variables was highly significant (χ^2=12.90, df=1, $p > .001$; contingency coefficient, C=.87).

A second test of this hypothesis was conducted by calculating Pearson's product-moment correlation between the percentage of time car

TABLE 7

Relation of Mothers' Usage of Restraining Devices for Themselves to Safe/Unsafe Infant Car Seat Usage (N=206)

Mothers' Use of Restraints	Infant Car Seat Usage	
	Safe	Unsafe
Safe	86	10
Unsafe	76	34

Chi-Square=12.90, df=1, $p < .001$, Contingency Coefficient C=.87

seats were used for infants, and the percentage of time safety restraints were used by the mothers. The coefficient of .21 was not large, but was significant at the .05 level. It is interesting to note that a large number of mothers apparently did not bother to use seat belts for themselves, but nevertheless practiced car safety for their children.

Hypothesis 3 is then supported. This finding agrees with those of previous studies (Pless & Roghmann, 1978; Newmann et al., 1974) which have indicated that the greater the use of seat belts by parents, the greater the use of restraining devices for their children when riding in cars. In conclusion, findings from this study provided supporting evidence that educating mothers regarding infant car safety, and maternal usage of restraining devices for themselves are factors which influence the safe usage of car seats by mothers for their infants. Maternal health locus of control was not shown to be an influencing factor.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Every year thousands of children are injured, and many die, as the result of automobile accidents. The use of infant car seats and restraining devices has been shown to decrease serious injury to children involved in accidents. The purpose of this study was to assess factors that influence the use of infant car seats as reported by mothers.

The research was conducted in cooperation with Kaiser Permanente Medical Care Program in which all subjects were enrolled as members. The sample consisted of 207 mothers who had delivered live babies during July and August, 1979, at Bess Kaiser Hospital. The mean age of these mothers was 27.6 years, and their mean educational level was 13.7 years. The majority (96.5%) of the mothers were married, or living with their partners. Their median family income of $18,833 was roughly equivalent to that of the average U.S. family. The sample was comprised mainly of stable families from middle and working class backgrounds.

Data were collected by mail questionnaires during January, 1980, when the infants were from 5 to 6 months old. The questionnaires requested information regarding the use of restraining devices in transporting the infant in a car, the source of the mother's knowledge about car safety, the mother's use of seat belts for herself, and whether involvement in a previous accident had influenced her use of restraining devices. The Multidimensional Health Locus of Control scale was also administered, to assess the mother's belief in the efficacy of her own actions in affecting health.

Three hypotheses were advanced to explain safe or unsafe use of

infant car seats. The first was that mothers who received more instruction regarding infant car safety instruction would report safe use of infant restraining devices to a greater extent than mothers with less instruction. This hypothesis was supported. The second hypothesis which stated that mothers with greater belief in the internal locus of control would report greater safe usage of infant restraints was not supported. The third hypothesis stated that mothers who used safety restraints for themselves would more frequently report safe usage of car seats for their infants. This hypothesis was upheld.

Among the other findings of this study, the following are of interest. First, mothers who had been involved in an automobile accident at some time in the past denied that the experience had influenced them to use car seats for their infants. Second, among the 31 mothers who stated they had received no safety instruction, 21 reported proper restraint for their infants. Third, almost 80% of the mothers used the infant car seats properly, and 53% claimed to use them 100% of the time. Fourth, many mothers reported receiving the information regarding infant car seat safety outside of the Kaiser system, and most frequently named the mass media as the source of information.

Some question as to the reliability of these findings may be raised on the basis of the limitations inherent in the research. First, the data were collected by mail questionnaire, and reported use may differ from actual use. Second, while the response rate of 61.3% is generally considered acceptable for such a study, it is possible that the 39% of the mothers who failed to respond included a larger proportion of nonusers of car seats than the respondents. It is, therefore, quite possible that safe use of restraining devices has been overestimated in this study.

Third, the validity and reliability of the instrument employed to assess locus of control may be challenged. And indeed, some of the subjects claimed to find the questions hard to understand.

The following recommendations might be made regarding the car safety instruction program implemented at Kaiser. Overall, the program may be considered a success in that 85% of the mothers stated they had received instruction. This success must be attributed to the multiple repetitions of the instruction. Wisely, Kaiser did not rely on dissemination of the information through the prenatal classes alone, since 30% of the mothers never attended them, and since some of those who did attend failed to be present at the specific sessions at which safety instruction was given. Repetition of the instruction on safety during the hospitalization period for delivery appears to be an important factor for success of the program, since 68.1% of the mothers received information there. It might be recommended, that for the 15% of the mothers who are missed, instruction be given in the pediatric clinics. In conclusion, the fact that Kaiser provides car seats at cost no doubt is a positive factor in the availability and use of infant car seats and should be encouraged.

Recommendations for further study include the replication of this study at regular intervals until the child is four years of age to determine whether reported car seat usage remains high. Second, it is recommended that this study be modified, through the use of direct observation and personal interviews to determine the difference between reported and actual usage. Third, the effect of prenatal versus postnatal teaching regarding infant car safety is an area where further study is needed. Finally, it is recommended that the influence of the mother's

significant others such as husband, friends, relatives, and health professionals, on the usage of infant car seats be further explored.

Reference Note

1. Physicians for Automotive Safety (Producer). A Safe Ride for Every Child. 50 Union Avenue, Irvington, N.J. (Film)

References

Allen, D., & Bergman, A. Social learning approaches to health education: Utilization of infant auto restraint devices. Pediatrics, 1976, 58, 323-328.

Becker, M., Drachman, R., Nathanson, C., & Kirscht, J. Mothers' health beliefs and childrens clinic visits: A prospective study. Journal of Community Health, 1977, 3, 125-135.

Charles, S. Stepchild of american pediatrics: Child transportation safety. Pediatric Annals, 1977, 6, 726-741.

Comstock, G., & Helsing, K. What kinds of people do not use seat belts? American Journal of Public Health, 1977, 67, 1043-1049.

Department of Health, Education and Welfare. Current estimates from the health interview survey, United States-1976. Vital Health Statistics, 1977, 119.

Glick, P.C. Updating the life cycle of the family. Journal of Marriage and the Family, 1977, 39, 5-13.

Henderson, J., Herbert, D., Stott, J., & Vazey, B. Performance of child restraints in crashes and in laboratory tests. Proceedings of the Seat Belt Seminar. Melbourne: Commonwealth Department of Transport, 1978.

Hoekelman, R. Principles of pediatrics, health care of the young. New York: McGraw-Hill Book Co., 1978.

Kanthor, H. Car safety for infants: Effectiveness of prenatal counseling. Pediatrics, 1976, 58, 323-328.

Levenson, H. Activism and powerful others: Distinctions within the concept of internal-external control. Journal of Personality Assessment, 1974, 38, 377-383.

Low, M. Accident prevention: A new approach in pediatric and parent education. Pediatric Annals, 1977, 6, 696-701.

McCusker, J., & Morrow, G. The relationship of health locus of control to preventive health behaviors and health belief. Patient Counseling and Health Education, 1979, 1, 146-150.

Miller, J., & Pless, B. Child automobile restraints: Evaluation of health education. Pediatrics, 1977, 1, 146-150.

National Safety Council. Accident facts. Chicago: National Safety Council, 1979.

Neumann, C., Neumann, A., Cockrell, M. & Banani, S. Factors associated with child use of automobile restraining devices. American Journal of Diseases of Children, 1974, 128, 469-474.

Pless, B., & Roughmann, K. Safety restraints for children in automobiles: Who uses them? Canadian Journal of Public Health, 1978, 69, 289-292.

Reisinger, K., & Williams, A. Evaluation of programs designed to increase the protection of infants in cars. Pediatrics, 1978, 62, 280-287.

Reiss, A.J., Duncan, O.D., Hatt, P.K., & North, C.C. Occupations and social status, Glencoe, Illinois: The Free Press, 1961.

Rotter, J.B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, (1), 1-28.

Rotter, J.B. Some problems and misconceptions related to the construct of internal verses external control of reinforcement. Journal of Consulting and Clinical Psychology, 1975, 43, 56-57.

Selltiz, C., Wrightsman, L.L., &Cook, S.W. Research methods in social relations (3rd ed.) New York: Holt, Rinehart & Winston, 1976.

Statistical Abstract of the United States-1977. Washington D.C.: Bureau of the Census, 1977.

Strickland, B. Internal-external expectancies and health related behaviors. Journal of Consulting and Clinical Psychology, 1978. 46, 1192-1211.

Wallston, B.S., & Wallston, K.A. Locus of control and health: A review of the literature. Health Education Monographs, 1978, 6, 107-117.

Wallston, B.S., & Wallston, K.A. & DeVellis, R. Development of the multidimensional health locus of control (MHLC) scales. Health Education Monographs, 1978, 6, 160-170.

Williams, A. Factors associated with seat belt use in families. Journal of Safety Research, 1972, 4, 133-138.

Williams, A. Observed child restraints use in automobiles. American Journal of Diseases of Children, 1976, 130, 1311-1317.

APPENDICES

APPENDIX A

Automobile Safety Restraints

for

Infants and Small Children

AUTOMOBILE SAFETY RESTRAINTS FOR INFANTS AND SMALL CHILDREN

A seat belt alone offers inadequate protection for infants and children weighing less than 40 pounds. THE ADEQUACY OF A SEAT CANNOT BE JUDGED BY LOOKING AT THE SEAT OR THE LABELING ON THE BOX IN WHICH IT IS PACKAGED! The seats pictured below and those mentioned on the reverse side of this pamphlet have all performed satisfactorily in crash tests conducted at the University of Michigan Safety Institute:

CENTURY TRAV-L-GUARD* (modified — see below): from 7 to 43 lbs.

A device that converts from a rearward facing infant carrier to a forward facing seat for the child able to sit without support. It raises the child to window viewing height. The seat is secured with the vehicle lap belt in both the infant and child positions.

Cost about: $25-$30

INFANT POSITION CHILD — TODDLER POSITION

Note — armrest has been removed in above pictures. (See text.)

* **NOTE:** The TRAV-L-GUARDS sold through the below mentioned hospital systems have the armrest removed because it serves no safety purpose but often misleads parents into forgetting the very necessary safety straps. With the removal of the armrest, the cost to you is reduced.

GM INFANT LOVE SEAT: from birth to 20 lbs.

A deep container that is particularly easy to use. The baby rides in a rearward facing position, held in place by a harness. The device is secured to the seat of the car with the lap belt of the vehicle.

Cost about: $15-$20

THESE CAR SEATS AVAILABLE AT:

Emanuel Hospital gift shop.
Kaiser Permanente Health Plan pharmacies.
Portland Adventist Hospital gift shop.
St. Joseph's Community Hospital gift shop.
University of Oregon Health Sciences Center gift services.
Vancouver Memorial Hospital gift shop.

****

Directions enclosed at purchase of above models must be read and followed carefully!

****

SAFE, USED CAR SEATS ARE ALSO AVAILABLE IN THE PORTLAND METROPOLITAN AREA!

Action for Child Transportation Safety, Inc. is a national organization dedicated to seeing all our children riding safely in motor vehicles. The local chapter buys and sells safe car seats at cost. For further information call:

Mrs. Jane Klemens	(503) 281-1529 Home (503) 280-4258 Work	Mrs. Nikki Rickard	(503) 282-9000
		Mrs. Susan Waldal	(206) 694-6383
Mrs. Marilee Mielke	(206) 694-9841		

F-111

(Please see reverse side)

APPENDIX B

Multidimensional Health Locus of Control Scale (Form A)

(Wallston, Wallston, and DeVellis, 1978)

This is a questionnaire designed to determine the way in which different people view certain important health-related issues. Each item is a belief statement with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you disagree or agree with the statement. The more strongly you agree with a statement, then the higher will be the number you circle. The more strongly you disagree with a statement, then the lower will be the number you circle. Please make sure that you answer every item and that you circle only one number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

Please answer these items carefully, but do not spend too much time on any one item. As much as you can, try to respond to each item independently. When making your choice, do not be influenced by your previous choices. It is important that you respond according to your actual beliefs and not according to how you feel you should believe or how you think we want you to believe.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2. No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3. Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4. Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5. Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6. I am in control of my health.	1	2	3	4	5	6

		Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
7.	My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8.	When I get sick I am to blame.	1	2	3	4	5	6
9.	Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10.	Health professionals control my health.	1	2	3	4	5	6
11.	My good health is largely a matter of good fortune.	1	2	3	4	5	6
12.	The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13.	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14.	When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15.	No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
16.	If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17.	If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18.	Regarding my health, I can do only what my doctor tells me to do.	1	2	3	4	5	6

APPENDIX C

Infant Car Safety Questionnaire

Infant Car Safety Survey

1. Date of mothers birth _____ Child's birth date_____

2. Is this your first child? _____

3. Present marital status (check one)

   _____ Married and living with spouse, or partner

   _____ Not living with spouse or partner (divorced, separated, single, or widowed)

4. What was the last grade of school you finished (please circle)

grade school	1	2	3	4	5	6	7	8
high school	9	10	11	12				
college	13	14	15	16				
post-graduate	17+							

5. Would you please estimate your total family income for the past 12 months?

   _____ under $5000

   _____ $5000 - $9999

   _____ $10,000 - $14,999

   _____ $15,000 - $19,999

   _____ $20,000 - $24,999

   _____ $25,000 - $29,999

   _____ $30,000+

6. Are you employed? Yes _____ No _____

7. If yes, what is your job? (Please be specific as to your duties)

   _____

   _____

   _____

8. If married or living with partner, what is his job? (Please be specific as to his duties)

   _____

   _____

   _____

9. Did you attend any prenatal classes? Yes _____ No _____

10. If yes, how many classes did you attend? _____

11. Was child car safety discussed at any prenatal class you attended?

    Yes _____ No _____

12. Did you see a film on child car safety? Yes _____ No _____

13. Where: Prenatal class _____ In the hospital _____

14. While you were in the hospital for your child's birth did anyone talk to you about car safety and car seats for children?

    Yes _____ No _____

15. Have you heard about car safety and car seats for children anywhere else in the community?

    Yes _____ No _____

16. If yes, where? _____

17. Do you own a car or have a car available for your use?

    Yes _____ No _____

18. Do you have a car seat for your baby? Yes _____ No _____

19. Was your baby in a car seat the last time he/she rode in the car?

    Yes _____ No _____

20. If yes, what brand or type? _____

21. Can you tell me in what direction the car seat was facing? (Please check)

    _____ Toward the front of the car (baby looking at the front of the car)

    _____ Toward the back of the car (baby looking at the back of the car)

22. How was the car seat fastened? _____

23. How often do you use the car seat? (Place an X on the line to best show how often you use the car seat from 0 to 100%)

    _____

    100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

24. Do you yourself use seat belts in the car? Yes _____ No _____

25. If yes, how often? (Place an X on the line to best show how often you use the seat belts from 0 to 100%)

100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%

26. Did you use seat belts yourself the last time you rode in a car?

Yes _____ No _____

27. Have you been involved in a car accident? Yes _____ No _____

28. If yes, did this influence your use of car seats and seat belts?

Yes _____ No _____

APPENDIX D

Letter of Explanation

KAISER PERMANENTE MEDICAL CARE PROGRAM

UNIVERSITY OF OREGON HEALTH SCIENCES CENTER

SCHOOL OF NURSING

Kaiser Health Plan of Oregon together with the University of Oregon Health Sciences Center School of Nursing is doing a survey on the effect of infant car safety instruction on car seat usage. The information is being gathered by Sally Guske, R.N. under the direction of Dr. Merwyn Greenlick and Dr. Julia Brown.

We are asking mothers who delivered a baby during July or August, 1979, whether they received information about infant car safety while they were pregnant, or in the hospital when the baby was born. If this applies to you, would you please complete the enclosed survey. The survey also asks about the use of infant car seats and seat belts, and your beliefs about health. To fill out the survey will take about twenty minutes of your time. There will be no benefit to you personally by doing the survey, but it will give information to Kaiser that may help other people. There are no risks to you by doing the survey. If you don't wish to take part in this survey, it will not affect you or your child's care at Kaiser in any way. If you do take part in the survey, our answers will be kept confidential. Your name will not appear on the survey records.

We hope that you will be willing to give your time to help us. Please return your completed survey in the stamped return envelope that is provided. If you have any questions, please feel free to call Sally Guske at 282-8703 during the evening from 7 p.m. to 9 p.m.

Thank you.

AN ABSTRACT OF THE THESIS OF

Sally Jo Guske

For the MASTER OF NURSING

Date of Receiving this Degree: June 8, 1980

Title: FACTORS DETERMINING THE USAGE OF INFANT CAR SEATS BY MOTHERS IN THE KAISER PERMANENTE MEDICAL CARE PROGRAM

Approved: [redacted]

Julia Brown, Ph.D., Thesis Advisor

The use of car seats and restraints for children have been shown to decrease the risk of serious injury to children during an automobile accident. The present study was undertaken to assess the effects both of the mother's instruction concerning child car safety, and of the mother's Health Locus of Control on reported usage of infant car seats by mothers. The instructional program being evaluated was that provided to mothers by Kaiser in prenatal classes, and in the hospital during the post-partum period.

A sample of mothers was drawn from those members of the Kaiser Permanente Medical Care Program who had delivered live infants at Kaiser during the months of July and August, 1979. Questionnaires were mailed to 346 mothers requesting information on their instruction in infant car seat safety, and on their health beliefs as measured by the Multi-dimensional Health Locus of Control Scale (MHLC) of Wallston, Wallston and DeVellis. Two hundred and seven usable questionnaires were returned. Respondents ranged in age from 19 to 39 years, and were predominantly from middle and working class backgrounds.

ABSTRACT OF THESIS

Three hypotheses were tested, namely: (1) mothers with more exposure to infant car safety instruction tend to report safe infant car seat usage more frequently than mothers with less exposure; (2) mothers with a greater internal health locus of control tend to report safe car seat usage more frequently than mothers with a greater external health locus of control; and (3) mothers who use safety restraining devices for themselves tend to report safe usage of infant car seats more frequently than mothers who do not use safety restraining devices.

The data showed that the greater the degree of exposure to the infant car safety instruction, the greater the reported usage of infant restraining devices by mothers. It was also shown that mothers who reported using seat belts for themselves, to a significantly greater degree than other mothers reported safe usage of car seats for their children. The first and third hypotheses were thereby supported. No significant relation was found between the mother's health locus of control and her use of infant restraining devices. Thus the second hypothesis was rejected.

The following conclusions were drawn: (1) instruction on child car safety influences safe usage of infant car seats; (2) history of past automobile accidents by mothers is not related to use of infant restraining devices; and (3) for this sample, the mass media were the most frequent source of information regarding child car safety outside of the Kaiser system.