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AUDIO-VISUAL INFORMATION PROGRAMS AS HEALTH PROMOTION AIDS IN HOSPITAL WAITING ROOMS

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ABSTRACT

A review of literature on child health problems indicated that many of the major child health problems were the result of personal behaviours, especially of parents, and the social conditions which supported these behaviours. The evidence suggested that parent education may be an important, and much neglected, influence on child health and that hospitals can play a worthwhile role in educating parents. It indicated that the use of media, especially video taped materials, may have considerable potential for educating parents about child health. The use of such materials in hospital waiting rooms was frequently recommended in the literature, although the effectiveness of such an approach was generally poorly researched and lacked any psychologically relevant theory.

Based on this review, and a consideration of practical and theoretical concerns, this study set out to assess the impact of video taped health programs in improving parent knowledge of child health practices in hospital waiting rooms. Following the development of a test of parent knowledge of child health practices, target groups of parents having poor knowledge were identified. Video taped programs, designed to be aimed primarily at these target groups were then compiled, and implemented in a field experiment to assess their impact.

It was hypothesised that the programs would significantly improve knowledge of child health amongst the low scoring target groups, and also parents as a whole. The overall effect of the programs was found to be small, as had commonly been found in other studies of media impact. Although there was a larger short term effect, retention of the health information was not strong overall. Larger effects on certain population subgroups (i.e., a number of the target groups) were found, especially in the short term. These findings support the view recently presented in the literature that media can have powerful effects under certain conditions. They are consistent with the

findings of other studies which demonstrate that media can benefit people who have low socio-economic status and those who are poorly educated.

A comparison of the effects of the programs on the target and non-target groups revealed a substantial narrowing of the "knowledge gap" between a number of these groups. These findings support a recent assertion in the literature that the knowledge-gap effect is not unavoidable. They indicate that media can reduce information gaps if the content is appropriately designed and transmitted.

Based on these findings it was considered that the behavioural effects of such an approach warrant future investigation.

DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text. Permission is granted for this thesis to be made available for photocopying and loan.

Signed:

Peter J. O'Connor
October, 1987.

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CHAPTER 1.

INTRODUCTION

1.1 CHILD HEALTH PROBLEMS

The decline in child death rates in the Western World is one of the striking characteristics of the twentieth century (Gandevia, 1978). In Australia, the greatest improvement occurred before 1940 and was primarily due to a decline in infant mortality from more than 10 to around 3 per hundred live births (Hetzel & Vimpani, 1980). Reductions in the death rates of older children have also been substantial. In the 1880's out of every 100 children born only 90 survived the first year of life and 78 reached adulthood (McKeown, 1976). Today just over 1 child in every 100 births dies during infancy and all but 2 reach adulthood (Hetzel & Vimpani, 1980). The decline in mortality largely preceeded the introduction of mass immunisation, antibiotics and post-war medical technological advances and is generally considered to have been due to general improvements in nutrition, housing and sanitation and to improved education standards amongst women (Wegman, 1977; Stanley & Hobbs, 1978).

Unfortunately, this achievement has not always been accompanied by a corresponding improvement in the level of health of the surviving children. The major health problems facing Australian children today include developmental difficulties, congenital defects, behaviour problems, accidents and nutritional disorders. After the first year of life more Australian children now die from accidents than any other single cause (Pearn, 1983). In school aged children accidents account for half of all deaths (Hetzel & Vimpani, 1980). Behaviour problems of sufficient severity to require management by professional services are estimated to affect one in ten Australian children (Hetzel & Vimpani, 1980). Obesity predominantly affects the health of adults, but has its roots in childhood (Hetzel & Vimpani, 1980). Haggerty, Rughmann & Pleiss (1975) have termed these health problems -- "the new morbidity", to

mark the change from the child health problems prevalent earlier in this century.

The emergence of this "new morbidity" has been accompanied by an increasing emphasis on prevention and personal behaviour. Curative medicine is regarded as being increasingly costly and generally inappropriate for significantly reducing many current child health problems (Beard, 1979). Beard (1979) states " the neglected frontier of personal behaviour has been increasing steadily in importance as a source of preventable disease and premature death" (p. 9). Whilst there are difficulties in interpreting many studies which claim to show causal links between personal behaviour and health status, a number of authors have argued that the links are strong. Knowles (1977), Belloc and Breslow (1972) and Smith (1977) consider that a high proportion of ill-health is a direct result of faults in personal behaviour. There is strong evidence of a causal relationship between poor maternal nutrition, and maternal smoking, and low birth weight in infants (Hemminki & Starfield, 1978; Butler & Alderman, 1969; Meyer, Jonas & Tonascia, 1976; Logo, 1977). The causation of childhood accidents appears to be dominated by environmental and human factors which have been identified as "self-imposed risks" (Gordon, 1973). Similarly, the increasing prevalence of obesity is considered to be largely related to personal factors as well as social influences (Hetzel & Vimpani, 1980).

Beard (1979) asserts that the greatest opportunity for reducing many of these health problems lies in health promotion aimed at changing personal behaviour and the social conditions which reinforce current health practices. A number of authors have argued that modification of parent behaviour through education has great potential for improving child health (Sparling & Lewis, 1981; Unger & Powell, 1980). Section 1.2 of this report briefly reviews the evidence in an attempt to understand the influence of parents and parent education on child health.

1.2 THE ROLE OF PARENT EDUCATION IN IMPROVING CHILD HEALTH

Sparling and Lewis (1981) have cogently argued that accurate child development information may serve a useful preventive health role. These authors, and also Unger and Powell (1980), have argued that information dissemination to parents is a highly cost-effective human service which not only enhances the parent's own knowledge base but that of others in their social network who in turn influence yet other parents and children. However, there are numerous studies which indicate that many parents have very little knowledge about correct child health practices (Lopez, 1976; Forsell, 1972; Draper, Field, Kerr & Hare, 1983; McCure, McKenna & Ritchie, 1981; Basser, 1977; Elderfield, Wilson & Hobday, 1971).

1.2.1 Parent knowledge of child health

Draper et al. (1983), in a survey of pregnant women from a range of socioeconomic and demographic backgrounds, found that less than 5% of women were well informed on the details and purpose of antenatal care by the time they became pregnant. He also showed that whilst all the women studied thought that nutrition was important during pregnancy only half were aware of the constituents of a balanced diet. McCure et al. (1981) found similar results in a study of maternal nutrition. Draper et al. (1983) also found that whilst most women thought iron was important during pregnancy many were unclear about the reasons for taking it.

Parental knowledge of immunisation is particularly low in Australia. About 30% of metropolitan mothers in Sydney thought polio was mainly a disease of children, 20% thought whooping cough to be a disease of children and more than 30% thought Diphtheria was a serious disease of children (Basser, 1977). Mesner et al. (1980) showed that 27% of children born consecutively in an inner city hospital in New South Wales had not completed their primary courses of immunisation at the end of their first year of life. Many of the parents of these children were reported to have no knowledge of how many doses of vaccine their children required. Elderfield et al. (1971) showed that

only 53% of a random selection of 2 year old children in Perth had received a full immunisation course and that the level of knowledge of immunisation requirements was poor, especially amongst middle and lower income groups. Burgess (1979) and Selge (1975) also found that there were considerable gaps in the knowledge of parents regarding how many doses were required to complete immunisation, especially amongst lower socioeconomic groups, some ethnic groups and rural dwellers, where uptake of immunisation was poor.

A number of other studies have shown that parental knowledge of child health is not uniform across socioeconomic and demographic groups. For example, McCune, Richardson & Powell (1984), in a detailed study of the correlates of parenting knowledge, found that age, education level and income were positively associated with parent's knowledge of child development, but that number of children, family stage and other demographic factors were not. Stevens (1984) also found positive correlations between family income, and maternal education, and parent knowledge of the environmental influences on child development. Field (1981), in a detailed comparison of the early development of preterm offspring of teenage mothers, found that adolescent mothers of preterm infants, in particular, showed unrealistic expectations regarding developmental milestones, in general expecting their infants to achieve these milestones earlier than was realistic.

1.2.2 Relationships between parent knowledge and parenting skill

There is some limited evidence of relationships between parent knowledge of child health and parenting skill, although the correlational nature of the studies makes interpretation difficult. For example, Stevens (1984) found that parents who knew more about child development, especially environmental influences on child development, manifested higher levels of parenting skills, although the correlation was moderate. He also found a positive correlation between family income and parenting skills. Epstein (1980) found that there was a positive relationship between parent knowledge of child development and the ability of parent's to note developmental aspects of parent and child

behaviours as displayed on video tape. England, Deinard, Brunnquell, Phipps-Yonas & Crichton (1979) reported that mothers judged to provide more adequate care for their infants manifested more accurate knowledge of child development than did an inadequate care group.

1.2.3 Effects of parent education on child health

The effects of parent education programs on the health of children has been studied by a number of authors. Whilst many studies have methodological problems and little theoretical underpinning, there is empirical evidence that such programs can be effective in certain circumstances. For example, Washington, Morganroth-Stafford, & Giannini (1977) found that a health education program significantly increased the knowledge of child health practices by a group of pregnant women, compared with a control group who didn't receive the health education program. Rudolph, Pendergrass, Clarke, Kjosness & Hartmann (1981) also found significant, and sizeable, increases in knowledge by parents of children with cancer immediately after an education program. The increase was largely maintained over a 3 month period.

Gordon and Guinaugh (1974) and Grantham-McGreggor and Desai (1975) found that in-home parent education, and training, produced changes in children's development. Banta, Higginbotham & Levin (1979) reported on a home-based early intervention program (the Child Health and Development Project) designed to promote parenting skills and to foster the physical, social and intellectual development of children from birth to 6 years of age. One of the principle goals of the project was to promote preventative health care through parent education. An evaluation of the group of parent's receiving the program (i.e. the experimental group), compared with a control group, who didn't receive the program, showed a significant, and sizeable, difference, in favour of the experimental group, in knowledge of child health practices (e.g. nutrition), parenting skills and also in child health outcomes, including cognitive development.

Ershoff, Aaronson, Danaher & Wasserman (1983) presented results of an evaluation of a prenatal health education program conducted within a health maintenance organization in the U.S.A. Specifically, the behavioural, birth and treatment-costs outcome for 57 women in an experimental group who received individual nutrition counselling and a home correspondence smoking cessation education program were evaluated against the outcomes, for 72 women in a control group who received only the standard pre-natal medical care. In comparison with the controls, a greater percentage of women in the experimental group quit smoking during pregnancy (49.1% vs. 37.5%, respectively). Of those who continued to smoke throughout their pregnancy, women in the experimental group had a greater reduction in their mean rate of daily smoking. A sigificantly greater percentage of experimental group women, compared with controls, were found to have adjusted their diets during the pre-natal period (91% vs 68.1%, respectively). Particular success was achieved by the experimental group women in increasing their consumption of dairy products and vegetables, decreasing their consumption of coffee and maintaining adequate weight gain during pregnancy. Comparison of the birth outcomes for experimental and control group women revealed a significantly higher mean birth weight amongst infants born to the experimental group women compared with controls (121.34 oz. vs. 113.64 oz., respectively). The experimental group also had fewer low birth weight infants (7% vs. 9.7% for controls). Hospital treatment cost savings associated with the reduced incidence of low birth weight infants among experimental group women yielded an overall benefit to cost ratio for the prenatal education program of approximately 2:1.

Research by developmental psychologists and others, over the past decade has indicated an association between the quality of the early mother-infant relationship and the child's later intellectual performance, social development and even physiological development (Clarke-Stewart, 1977; Ainsworth & Bell, 1974). For example, Casey and Whitt (1980) found that child health supervision

(i.e. counselling and anticipatory guidance), improved mother-infant relationships and infant development. A group of mothers receiving child health supervision (i.e. the experimental group) were rated significantly more highly on sensitivity, co-operation and appropriateness of interaction and play with their children than a control group who did not receive such supervision. Infants of the experimental group mothers were more advanced on a "Vocal Imitation" scale compared with infants of control group mothers. In a study which was similar to that by Casey and Whitt (1980), Gutelius, Kirsch, MacDonald, Brooks & McErlean (1977) found that children of underpriviledged parents receiving child health counselling and anticipatory guidance by paediatricians and nurses, during the first three years of life, had significantly better behaviour than a control group whose children received the same medical services but no counselling or guidance. Some of the behavioural effects of the counselling and guidance were the following: significantly better feeding, on the part of child, and a broader range of foods presented by parents; significantly less developmental delays including earlier extinction of thumb-sucking, less pica, less night waking, earlier toilet training and less behavioural disorders at age 4 - 5 years; and significant differences in intelligence (Stanford - Binet) at age 3 years.

Field (1981) found that the children of teenage mothers exposed to a neo-natal education and training program (i.e. the experimental group) showed more optimum growth (i.e. greater weight and height) at four months compared with a control group who did not receive the program. In addition, the Denver scores (i.e. adaptability and cumulative scores) of the experimental group children were higher, their systolic and diastolic blood pressures were lower and the experimental group mothers viewed their infants as having less difficult temperaments compared with control group mothers. Experimental group mothers also had less anxiety and lower systolic blood pressures than control group mothers. Osofsky & Osofsky (1970) also showed that there was no biological disadvantage to the offspring of teenage mothers, compared with

the offspring of other mothers, following pre-natal intervention involving parent education and training.

In an extension to Field's (1981) study, Field, Widmayer, Greenberg & Stoller (1982) continued the parent education program beyond the neonatal period and up to 6 months after birth. The children of the teenage mothers who were exposed to the program showed superior growth and development (including weight, motor skills and Bayley mental test scores) during the first 2 years after birth, compared with the children of a control group of mothers who didn't receive the program.

There have been numerous studies showing the stress-reducing effects, and improvements in post-operative functioning, due to systematic psychological preparation for hospitalisation and surgery (Vernon, Schulman & Foley, 1966; Visintainer & Wolfer, 1975; Vernon, Foley, Sipowicz & Schulman, 1965; Fortin & Kirouac, 1976; Amend, 1966; Moyer, Collette & Ludtke, 1966) using a range of methods, including hospital tours and booklets (Azarnoff, Bourque & Green, 1975), puppet therapy (Cassell, 1965) and also films and video-tapes (Kapelis, 1983; Melamed & Siegel, 1975; Vernon, 1973). However few studies have fully considered the effect that parents, especially mother's may have on the child's level of emotional tension. Skipper and Leonard (1968) suggested that mother's may be the prime factor in determining whether changes in their childs' emotions and behavior will be detrimental or beneficial to his treatment and recovery. They showed that presentation of information to mothers concerning child hospitalisation reduced the mother's stress levels and produced changes in the mother's definition of the situation, which resulted in a lowering of the stress associated with hospitalisation for the child and an improvement in the child's physiological, and psychological, functioning and social behaviour. Children of mothers presented with such information (i.e. the experimental group) displayed less crying and sleep disturbances compared with children of mothers not presented with such information (i.e. the control group). Control group children displayed an

unusual fear of hospital staff and more regressive behaviour (e.g. thumb sucking and bed wetting) than experimental group children. Wolfer and Visintainer (1979) also showed that a group of parents and children who received a pre-hospitalisation education program displayed less parental anxiety, increased satisfaction with care and also better adjustment in children, compared with control groups who didn't receive the education program.

1.2.4 Problems with current parent education programs

The foregoing discussion indicated that educating parents about child health can have important effects on child health, and also effects on the health of parents themselves. However there are a number of studies which suggest that many current parent education programs miss the groups in greatest need of information about child health. For example, Murrell and Moss, (1977) found that lower socio-economic groups in Adelaide used established parent courses less frequently, commenced ante-natal care significantly later and attended ante-natal psychoprophylactic exercise classes less often, than higher socio-economic groups. They considered that it was doubtful whether sufficient folk knowledge within the communiy was available to compensate mothers who missed out on health education during pregnancy. Tyser (1975) also found that only the most motivated of parents go to parenting courses.

Other studies suggest that many parenting courses are conducted either too early, or too late, to have any effect. For example, Field (1981), in a review of parent education courses for teenage mothers, concluded that most courses cease at delivery, or shortly after, when indeed the need for intervention appears to be most critical. Thus while pre-natal intervention courses may markedly attenuate perinatal medical risks for teenage mothers and their offspring, Field (1981) argues that they do not solve the longer term social and educational consequences for the mother and her offspring. Draper et al.

(1983) found that most ante-natal classes are arranged too late in pregnancy to influence dietary and smoking habits which have effects on children.

Another problem with many parent education programs concerns the lack of adequate evaluation and a theoretical orientation. Many studies are plagued with methodological problems which make interpretation less favourable than many authors would like to think.

In consideration of the above, and other, findings a number of authors have suggested that parenting courses should be modified, that other methods of educating parents should be investigated and that such courses should be properly evaluated (Beard, 1979; Murrell & Moss, 1977; Tyser, 1975).

1.3 THE ROLE OF HOSPITALS IN PARENT EDUCATION.

Beard (1979) has argued that hospitals have an important and, in Australia, a much neglected role in such education programs. He says "In Australian hospitals it is possible for a patient to receive an account for hundreds of dollars for investigations and treatments as an in-patient and to return home without knowing any more about the cause or prevention of his disease than he knew when he was admitted" (p. 29). He goes on to say that "As an in-patient with time on his hands, he and others with similar conditions had formed a captive audience, with more than a passing interest in relieving their boredom and learning something about how to stay out of hospital in future. The same is true of out-patients" (p. 29). There are, however, few examples of parent education programs in Australian hospitals.

In most Australian hospitals parent education is left to individual medical practitioners. Surveys have shown that 40-60% of the paediatric time of medical practitioners is spent on child health supervision, and only a small proportion of time is spent on managing chronic illnesses (McCune et al., 1984; Hoekelman, 1975). The opportunities for educating parents about the prevention of disease and the promotion of health are therefore enormous. However, communications between doctors and patients have been shown in many studies to be generally unsatisfactory (Clarke, Engel, Jolly & Meyrick,

1976; McCune et al., 1984; Deisher, Engel, Spillholz & Standfast, 1965; Starfield & Barkaof, 1969; Hobbs, Eardley & Thornton, 1977; DeHaes, 1982; Raimbault, Cachin, Limal, Eliacheff & Rappaport, 1975). Unsatisfactory, that is, from the point of view of the effectiveness of the communication and the dissatisfaction, of the parent and patient with it. For example, in a study based on the observation of 800 mother/doctor interviews Korsch and Negrete (1972) found that nearly half of the sample of mothers left the interview unsure of what caused their childs' illness, and that nearly 20% felt that the illness had not been properly explained to them. It is not surprising therefore that a number of studies have found low compliance with medical regimens (Davis, 1966, 1968; Elling, Whittemore & Green, 1960; Korsch & Negrete, 1972). Davis (1966) also found that patient dissatisfaction with service, and non-compliance with medical regimens, was highest in groups identified as being in greatest need of information and medical care i.e. in lower socio-economic groups, aged persons and the poorly educated.

There are a number of studies which have attempted to determine the reasons for poor doctor/patient communications and non-compliance with medical regimens. Block and Rash (1981) have identified that a lack of time, by doctors, to adequately explain the reasons for the treatment given and the means of preventing a recurrence of the condition, has been commonly reported in the literature as one of the major reasons for poor communications. Ley (1972) reviewed the literature on doctor-patient communications and came to the conclusion that communications from doctors to patients frequently failed, and that it was likely that both failure to understand and failure to remember was partly responsible. Raimbault et al. (1975), in an analysis of transcripts of doctor-patient interactions, found that doctors often talked at cross purposes with parents and patients, evading emotional issues in favour of quasi-scientific explanations which were not understood. Hobbs et al. (1977) and DeHaes (1982) characterised the doctor-patient relationship as one of inequality owing to differences in education,

training and socio-economic status. They argued that patients were usually ignorant of the biological-technical aspects of their illness and, due to the medical jargon used, frequently misunderstood even the simplest statements and instructions from the physician. Innes (1977) has suggested that "A common factor underlying lack of communication between doctor and patient may be the failure of the doctor *to put himself in the position of the person asking advice*" (p. 636). Pratt, Seligmann & Reader (1957), in an empirical study on physicians' views of the level of medical information amongst patients, found that physicians could not accurately judge the level of knowledge of patients and that when they judged patients to have poor knowledge they spent less time explaining the causes and means of preventing the illness.

A number of authors have suggested that medical training may accentuate differences between client and practitioner and add to communication problems (Innes, 1977; Carkuff, 1968; Jones, 1976). For example, Innes considers that a fundamental problem with doctor/patient interactions is the tendency to perceive another persons behaviour as being caused by predispositional traits within that person rather than by situational events. He reviewed evidence by authors such as Jones (1976) and Batson (1975) which suggested that professional training may exacerbate such a tendency. Jones (1976) argues that due to their training doctors may be more inclined to diagnose and treat states endogenous to the patient rather than altering the patients' behavioural setting.

Werner, Adler & Robinson (1979) and Starfield and Borkowf (1969) consider that another problem with medical training programs, which causes communication problems, is their concentration on physical illness, bodily systems and functions rather than psychosocial problems. Starfield and Borkowf (1969) found that because of this focus doctors frequently do not attend to the social and psychological problems presented by patients. Patients

therefore frequently leave the consultation without any information or guidance on the resolution of these problems (Deisher et al., 1965).

Whilst there is probably much that can be done to improve medical training, and therefore doctor/patient communications, through the application of theoretical social psychological developments (Innes, 1977), hospital involvement in educating parents' about child health does not need to be left to the doctors. A number of authors have suggested that the use of media holds great promise for hospital based health promotion programs (Beard, 1979; Midgley & Macrae, 1971; Clarke, Devine, Jolly & Meyrick, 1977; Clarke et al., 1976; Hobbs et al., 1977; Tyser, 1975).

1.4 THE USE OF MEDIA IN HOSPITAL BASED PARENT EDUCATION PROGRAMS

There are a number of studies reporting the use of a range of media in hospital based health promotion programs, with varying degrees of success. For example, Clarke et al. (1976) used health information recorded on cassette tapes, replayed over telephones, to promote health education in a waiting room. However, their evaluation showed that this approach was not successful. Bartlett, Johnston & Meyer (1973), Bartlett and Meyer (1976) and Meyer, Jonas & Tonascia (1976) also developed a number of telephone access health information programs; however, they did not conduct any useful evaluations of their effectiveness.

Books, pamphlets, posters and displays have been widely used. Their effectiveness has, however, been rarely evaluated. Where they have been evaluated they have generally been found to have poor impact (Cole & Holland, 1980; Wingfield & Williams, 1969). A notable exception is a study by Wolfer and Visintainer (1979) who developed a booklet designed to be used to prepare children and their parents, for hospitalisation and surgery and found significantly less stress and better adjustment in the group receiving the material compared with a control group who did not receive the material.

A particularly promising line of work is the use of television and audio-visuals for patient and family health promotion in hospitals. Aldis, Winnifred,

Hill & MacDonald (1969) have suggested that a major advantage of televised health education is the potential for reaching large numbers of people simultaneously. It has been demonstrated that television monopolizes the free time of the less educated and lower-income groups who are often the target groups for information about health (McGuire, 1985; Gerbner, Gross, Morgan & Signorielli, 1981). The potential for television and other visual media to stimulate high recall and to educate people who have poor reading skills, or are illiterate, has also been demonstrated (Johannsen & Engelsing, 1970; Richman & Urban, 1978).

There are numerous examples of the effective application of television and audio visual productions to health promotion in hospitals (Waldner-Guttentag & Ketner, 1983; Lau, Kane, Berry, Ware & Roy, 1980; Aldis et al., 1969; Midgley & Macrae, 1971; Kapelis, 1983; Bracken, Bracken & Landry, 1977; Carr, 1979). For example Klinzig and Klinzig (1977), Vernon (1973) and Kapelis (1983) have demonstrated that films and video tapes using modelling effects, represent a low cost method of increasing knowledge, improving attitudes, reducing stress and anxiety and aiding in the recovery of children following hospitalisation and surgery. Bracken et al. (1977) found that a video taped education program was as least as effective in increasing the knowledge of patients who had a myocardial infarction, as the more costly and time consuming lectures by doctors and other staff. Hirsch and Clarke (1975) found that a tape-slide program on the subject of dental hygiene produced significant improvement in dental health (as measured by gingival, and plaque, indices) and knowledge of dental health in groups exposed to the program compared with other groups not exposed to the program, and was at least as effective in plaque control as personal contact with a dentist.

The potential for educating large captive audiences of parents and patients in hospital waiting rooms using audio-visual presentations has been identified by a number of authors (Beard, 1979; Tyser, 1975; Hobbs et al., 1977). However there are few examples of such programs reported in the literature and where

they have been reported they have generally not been evaluated (Rinaldi, Good & Silverman, 1977; Waldner-Guttentag & Ketner, 1983; Turner & Larcombe, 1983). Notable exceptions are studies by Midgley and Macrae (1971) and Clarke et al. (1977). In a before/after repeated measures study design, Midgley and Macrae (1971) showed a 20% increase in patient knowledge of their medical condition (i.e. angina) following exposure to an audio-tape in the waiting room setting. Clarke et al. (1977), in a static group comparison, demonstrated significantly, and sizeably, greater knowledge of general health matters amongst a group of patients (i.e. experimental group) exposed to a health information display machine in a waiting room, compared to a sample of people (i.e. control group) from a shopping centre who were not exposed to the machine. Differences in the proportions of the experimental and control groups who gave the correct answers ranged from 12% for one question to 91% for another. The design of these studies was however poor and there was the possibility of influence of extraneous variables through self selection and non-equivalence of the groups prior to the intervention.

The value of such approaches therefore requires further testing and exploration. In consideration of this, and the need to educate parents about child health, it was decided to conduct a controlled field experiment involving the use of video-taped health programs in hospital waiting rooms. During the development of the experiment the psychological and communications research literature was reviewed to determine successful approaches and relevant theoretical considerations which could be applied to the research problem. The results of this review are detailed in the following sections.

1.5 ASSESSMENT OF THE IMPACT OF MEDIA APPROACHES

1.5.1 The limited effects position

Until recently the thinking of communication researchers was dominated by the view that the effects of mass media on public beliefs and behaviour were minimal. The so-called "limited effects" position arose from Klapper's (1960) review of communications research prior to 1960. He concluded that

mass communication ordinarily did not serve as a necessary and sufficient cause of audience effects and that it primarily served to reinforce existing beliefs and behaviours. He did, however, qualify his conclusions and consider that under certain conditions some groups may be greatly affected by the mass media. Roberts and Maccoby (1985) consider that the support for the limited effects position was largely a reaction by communication researchers to public fears of powerful effects of the media following their use during World War I propoganda. They also consider that Klapper's (1960) qualifying statements were largely ignored. However, following Klapper's review there was a steady stream of studies reporting minimal effects due to mass media (e.g. Katz & Feldman, 1962; Patterson & McClure, 1976; Sears & Chaffee, 1979).

1.5.2 Powerful effects under limiting conditions

As a results of recent research on "agenda setting" (McCombs & Shaw, 1972; Iyengar, Peters & Kinder, 1982) and the effects of mass media campaigns on such public issues as heart disease prevention (Maccoby, Farquhar, Wood & Alexander, 1977; Farquhar et al., 1977) many contemporary researchers now consider that mass media may have important, and often powerful, effects on the way in which various groups of people think and behave (Roberts & Maccoby, 1985). However earlier stimulus-response models which conceptualised the power of mass media in relatively straightforward cause and effect terms have been replaced with "models of powerful effects under limiting conditions" (Roberts & Maccoby, 1985, p. 542). Supporters of these models view the power of the media as highly conditional, "depending on a variety of contingent and/or contributory third variables" (Roberts & Maccoby, 1985, p. 542). Recent research on the cognitive and behavioural impact of the media illustrates the conditional nature of the effects.

1.5.3 Cognitive effects

McGuire (1969), Roberts and Maccoby (1985) and Chaffee (1977) have identified a historical tendency to overemphasise the attitudinal dimension of the effects trichotomy (i.e. attitude-cognition-behaviour). Recent research

has however given way to a recognition that: attitudinal effects are often neither necessary nor sufficient to produce behaviour change; and cognitive effects are often necessary and sufficient to produce behaviour change and are important effects in their own right (Chaffee, 1977).

Roberts and Maccoby (1985) consider that the basic effect of media is learning arising from the incorporation of information into existing conceptualisations of the world. As they say "a necessary precursor to behavior is the acquisition of cognitions about how to act and about the conditions under which given behaviors are or are not appropriate" (Roberts & Maccoby, 1985, p. 559).

A number of studies have shown that the effects of media on information levels are influenced by a range of conditioning variables including demographic variables, such as age, sex and education, and psycho-social factors such as group membership and motivations for using media (Roberts & Maccoby, 1985; Atkin, Galloway & Nayman, 1976; Chaffee & Izcaray, 1975). Recent research on the knowledge-gap hypothesis demonstrates the complexity of the effects of media on information levels.

1.5.3.1 Knowledge-gap hypothesis

The knowledge-gap hypothesis formulated by Tichenor, Donohue & Olien (1970) states that people of lower socioeconomic status acquire information at a slower rate than those of higher socioeconomic status. Ettema and Kline (1977) have identified three types of explanatory mechanism for the "gap" phenomenon: ceiling effects in knowledge; communication deficits in people of low socioeconomic status; and differences between status groups in the perceived relevance of, and motivations to acquire, the information.

Although Roberts and Maccoby (1985) consider that there is some evidence to support each of these mechanisms it appears that the "gap" effect may not be unavoidable. A number of studies have shown that media can benefit the undereducated and reduce information gaps if the content is appropriately designed and transmitted (Donohue, Tichenor & Olien, 1975; Maccoby et al.,

1977; McLeod, Bybee & Durall, 1979; Shingi & Mody, 1976; Tichenor, Rodenkirchen, Olien & Donohue, 1973). Roberts and Maccoby (1985) and Ettema, Brown and Luepker (1983) have also suggested that conditions which increase the motivation of the target groups to acquire information will tend to reduce the "gap" effect.

5.3.2 Agenda setting

McCombs and Shaw (1972) coined the term "agenda setting" to refer to the possibility, first noted by Lippman (1922), that media do not persuade people what to think but what to think about. Whilst a number of studies have demonstrated an "adenda setting" effect of television (e.g. McCombs & Shaw, 1972; Patterson & McClure, 1976; Zucker, 1978; Siune & Borre, 1975) other studies have failed to show such an effect (e.g. Becker, Weaver, Graber & McCombs, 1979). Iyengar et al. (1982) consider that evidence on the agenda setting function of media is confusing due to the frequent use of cross-sectional research studies to study what is essentially a temporal phenomenon. They report that dynamic studies such as those by Funkhouser (1973) and MacKuen and Coombs (1981) provide better tests of the effect. The field experiment by Iyengar et al. (1982), which monitored the community agenda over time in relation to media activity, supported the results of the dynamic studies (Funkhouser, 1973; MacKuen and Coombs, 1981) in showing a significant "agenda setting" effect. Their research also suggests that media may not only influence what people think about but that it may alter the standards by which people evaluate social reality -- they term this effect "priming".

Conditioning variables which have been examined in relation to the "agenda setting" effect include age, education, media preferences (MacKuen, 1981; McCleod, Becker & Byrnes, 1974; Williams & Semlak, 1978; Mullins, 1977), interpersonal discussion (Atwood, Sohn & Sohn, 1976), need for orientation (Weaver, 1977; Weaver, McCombs & Spellman, 1975), type of medium (Benton & Frazier, 1976; Mullins, 1977; Weaver, 1977; Williams & Larsen, 1977) and

exposure (Patterson & McClure, 1976). Roberts and Maccoby (1985) consider that sufficient research has been conducted to permit the following tentative generalisations: "the strength of the agenda-setting effect, when it occurs, seems directly related to the amount of news exposure"; and "studies that compare the influence on public agendas of newspapers and television tend to agree that print exposure has a greater effect" (p. 564-565), especially for local issues (Palmgreen & Clark, 1977).

1.5.4 Behavioural effects

Although there are numerous examples of media campaigns which have failed to influence behaviour (e.g. Udry, Clark, Chase & Levy, 1972; Robertson et al., 1974; Weiss, 1969), much of the recent interest in communications research has been stimulated by findings of significant, and often powerful, media effects on smoking cessation (McAlister, 1981), heart disease prevention (Farquhar et al., 1977), nutrition (Rogers, 1976), energy conservation (Farhar-Pilgrim & Shoemaker, 1981), attendances at V.D. clinics (Greenberg & Gantz, 1976) and helmet wearing by cyclists (Wijgh, 1986). For example, an evaluation of the "Feeling Good" series, a television production which combined health information with entertainment and was aired over a six month period on public television in the U.S.A., showed that behaviour changes were produced, although they were largely restricted to those people who were initially motivated toward such behaviours anyway (Mielka & Swinehart, 1976).

The most significant study of media effects to date is the "Stanford Heart Disease Prevention Program". The study showed that a mass media campaign could increase knowledge and effectively produce changes in cardiovascular risk factors and that on a cost effectiveness basis it was more beneficial than a media plus community activity approach (Farquhar et al., 1977; Maccoby et al., 1977). Behaviour changes due to the media were however restricted to simple behaviours (i.e. changes that are not deeply ingrained and for which there exists an easy substitute for an almost equally satisfying behaviour e.g. substitution of margarine for butter, or skim milk for whole milk). The study

also showed that in order to produce complex behaviour change, reinforcement or social support, in the form of personal communication, was needed to compliment the media. Whilst the methodology of the "Stanford" study has been criticised by Leventhal and his colleagues (Leventhal, Cleary, Safer & Gutmann, 1980), similar results have been found in studies employing different evaluation methodologies (e.g. McAlister, 1976; Puska & Neittaanmaki, 1980). As a result it has become generally accepted that whilst simple behaviour changes can be produced by media alone, the effects will be greater, and will include changes in complex behaviours, when supplemented with community activity and face to face communications (Griffiths & Knutson, 1960; Rogers, 1973; Vingilus & Salutin, 1979; Cameron, 1979; Wallack, 1981).

1.5.5 Size of effects

An indication of the level of change which might be expected across the full population from the use of mass media is provided by Gatherer, Parfit, Porter and Vessey (1977) who, in a detailed analysis and review of nearly 50 media studies conducted largely in the 1970's, found reported knowledge changes of 6% or less, changes in attitude of 3-6% and long term behaviour changes of less than 10%, in developed countries. They also found that in 64% of the studies which had knowledge change as an aim (11 studies) there was an increase reported; in 100% of studies (8 studies) in which attitude change was the aim, there was a change reported; and in 67% of the studies (30 studies), in which behaviour change was the aim there was a change reported. It appears therefore that whilst changes in knowledge, attitudes and behaviour can be achieved by mass media alone, the size of the effects on full populations have generally been small. Chaffee (1977) has however reviewed studies which suggest larger effects, under certain circumstances, for specific population subgroups.

1.6 COMMUNICATION THEORY

Demonstration of the conditional nature of media effects has led to a significant trend in communications research away from questions posed in terms of overall effects. Roberts and Maccoby (1985) consider that "current work tends to be more interested in identifying and elaborating the various conditions that lead some audience members to be affected in one way, others in another, and still others not at all" (p. 550). This emphasis on conditional analysis is concerned not so much with the demonstration of statistical effects as it is with understanding the nature of the relationship -- i.e. it is concerned with the development of communication theory. McGuire (1985) has developed a classification matrix to facilitate the cross study comparisons needed for the development of such theory. A brief review of research relating to selected components of the matrix follows.

1.6.1 Source variables

McGuire's (1985) review focusses on three types of source variables i.e. credibility, attractiveness and power. He states that a source's credibility is judged "from his or her apparent competence and trustworthiness, i.e., knowledge of the truth and motivation to reveal it." (p. 262). He considers source attractiveness to be judged by receivers on such factors as similarity, familiarity and likeability. Power is considered to be inferred from the sources control over rewards and punishments, concerns about receiver's compliance and ability to monitor this compliance (McGuire, 1985).

1.6.1.1 Source credibility

There is considerable evidence that perceived source credibility and the persuasive impact of any communication generally increases with knowledgeability cues, for example, education, social status, qualifications and intelligence (Hass, 1981), and also with such subtle factors as source posture (Weisfeld & Beresford, 1982) and height (Feldman, 1971). However, the evidence also suggests that unless source knowledgeability is reinforced by such characteristics as trustworthiness the persuasive impact of the message

may be limited (Kelman & Hovland, 1953; Bochner & Insko, 1966; McGinnies & Ward, 1980). Trustworthiness seems to be assessed from cues about a source's apparent sincerity, detachment from the outcome and lack of persuasive intent (Wheeless & Grotz, 1977; McGinnies & Ward, 1980). In particular, science, medical and academic groups are generally seen as highly trustworthy (Etzioni & Diprete, 1979; Gallup Poll, 1981).

1.6.1.2 Source attractiveness

There is considerable evidence that sources who are liked (Sampson & Insko, 1964) and perceived as similar to the receiver (Byrne, 1971; Stoneman & Brody, 1981) are more persuasive than non-liked and dissimilar sources. Factors such as physical appearance, friendship and romantic ties contribute to likeability (Newcomb, 1981; Hendrick & Hendrick, 1982; Kelley, 1983). However there is evidence that under certain conditions a disliked source can be more persuasive. For example, people who have been induced by a source to perform a noxious behaviour show more attitude change when the source is disliked (Zimbardo, Weisenberg, Firestone & Levy, 1965; Finer, Hautaluoma & Bloom, 1980). Similarly there is evidence that source similarity can be less persuasive when, for example, the receiver interprets the source's similarity as manipulative or as restricting the receiver's desire to be different (Jones & Wortman, 1973; McGuire & Padawer-Singer, 1976; Santee & Maslach, 1982).

1.6.1.3 Source power

A sources perceived control over reinforcement and punishment, concern for compliance, ability to scrutinise compliance and leadership have generally been found to increase compliance -- eliciting power and therefore persuasive impact (Kelly & Thibaut, 1978, Galbraith, 1983). There are however situations in which sources perceived as having low power are more persuasive as, for example, when a disadvantaged group elicits greater compliance through sympathy (Lesk & Zippel, 1975; Levitt & Kornhaber, 1977).

1.6.2 Message variables

An extensive number of message variables have been identified and researched including type of appeal, message style, inclusions and exclusions, extremity of position and message order (McGuire, 1985).

1.6.2.1 Type of appeal

Evidence on the relative persuasive superiority of positive versus negative appeals indicates a dependence on the nature of the output. For example, negative appeals have been found to produce more immediate intention to comply and more reported compliance but less message recall and less actual longer term compliance (Evans, Rozelle, Lasater, Dembroski & Allen, 1970; Beck, 1979). Positive appeals have been found to promote coping with danger whilst negative appeals have been found to promote coping with the effect (Monat & Lazarus, 1977; Leventhal & Nerenz, 1983).

There is a great deal of evidence, principally by the developers of the Health Belief Model, which suggests that messages heightening the perceived probability, and severity, of a threat and perceived benefits and costs of a particular preventive behaviour generally influences an individual's psychological readiness to take action (Becker, Kaback, Rosenstock & Ruth, 1975; Hochbaum, 1958; Leventhal, Hochbaum & Rosenstock, 1960; Kegeles, 1963a, 1963b; Rosenstock, Derryberry & Carriger, 1959; Jaccard, 1975; Goodstadt, 1975; Heinzelmann, 1962; Flach, 1960; Haefner & Kirscht, 1970; Heinzelmann & Bagley, 1970; Fink, Shapiro & Roester, 1972; Battistella, 1968; Cochman, 1971). However, it has also been shown that the influence of such messages depends on the efficacy of the recommended coping responses, anxiety levels (Millman, 1968; Lehmann, 1970), coping styles (Goldstein, 1960) and life-style (Berkowitz & Cottingham, 1960; Beck & Davis, 1978). For example, Rogers and Mewborn (1976) showed that when effective preventive practices were presented, increments in the probability and severity of a threat facilitated attitude change whereas an ineffective coping response had either no effect or a deleterious effect as the threat was increased.

Personal appeals seem to be more successful than impersonal appeals (McBride & Peck, 1970; Puska & Neittaanmaki, 1980; Powell, 1965) although this may not hold for anxiety arousing messages (Nunnaly & Bobren, 1959).

1.6.2.2 Message style

Research has shown that speedier delivery enhances the persuasive impact of a message by making the source appear more credible (Miller, Maruyama, Beaber & Valone, 1976; Apple, Streeter & Krauss, 1979). Mechanical time compression of advertisements by as much as 40% has been found to increase interest in, and comprehension of, the message (LaBarbera & MacLachlan, 1979) but reduce the generalisation of related cognitions (Schlinger, Alwitt, McCarthy & Green, 1983). Figurative language and vivid information have also been found to increase persuasive impact (McCroskey & Combs, 1969; Bowers & Osborn, 1966; Reinsch, 1974; Sherer & Rogers, 1984) although the use of obscure and unusual language has been found to reduce the persuasive impact in some receivers (Bowers, 1963; Carmichael & Cronkhite, 1965). The effect of humerous presentations appears to be conditional on a number of mediating and interacting variables and has been rarely found to have a main effect on attitude change (McGuire, 1985).

1.6.2.3 Inclusions and exclusions

Based on a review of a large number of studies McGuire (1969) considered that explicitly drawing the conclusions increases the effectiveness of a message, especially for the less well educated, who may otherwise misunderstand the message. Where a definite plan of action has been recommended preventive health behaviours have generally been adopted (Leventhal, Singer & Jones, 1965; Leventhal, Jones & Trembly, 1966; Leventhal, Watts & Pagano, 1967; Evans et al., 1970; Leventhal & Niles, 1964).

1.6.2.4 Opposing arguments

McGuire (1985) in his recent review of research on attitude change considers "It is better to acknowledge and refute opposition arguments, even before presenting arguments for one's own side, if they have been made

salient by familiarity (Hass and Linder, 1972) or controversiality (Jones and Brehm, 1967) or by the receiver's intelligence or initial opposition" (p. 272). There is also evidence that two sided communications are more effective in "inoculating" the audience against counter-propoganda (Lumsdaine & Janis, 1953; McGuire, 1964).

1.6.2.5 Effects of message repetition

There is strong evidence that persuasive impact generally increases for the first few repetitions but that further repetition adds little and may even diminish the effect (Calder & Sternthal, 1980; Cacioppo & Petty, 1979; Becker & Doolittle, 1975). However, there is also evidence that the effect of message repetition is contingent upon the strength of argument, with the weakness of poor arguments being made more obvious by repetition (Cacioppo & Petty, 1984).

1.6.2.6 Selective exposure

One of the common explanations for the failure of media campaigns involves the hypothesis of selective exposure i.e. "That people seek out messages supporting positions they already hold and avoid discrepant messages" (McGuire, 1985, p. 275). There is, however, little empirical support for the hypothesis (Sears & Abeles, 1965, Sears & Freedman, 1967, Weiss, 1971; Milburn, 1979). For example, Brock (1965) found that both smokers and non smokers expressed interest in literature documenting the link between smoking and lung cancer. Feather (1962) found that smokers generally preferred to read articles contradicting their beliefs irrespective of whether they were believers or dis-believers in the smoking-lung cancer link. In a reanalysis of the Stanford Heart Disease Prevention Program data, Milburn (1979) found little support for the selective exposure hypothesis. There is even evidence that discrepant material may be preferred because it may be more interesting and useful (Berlyne, 1969; Swann & Read, 1981) and give rise to greater pleasure in complex receivers due to its novelty (Streufert & Streufert, 1978), especially for low involvement issues and where self esteem is not

threatened (Frey & Wickland, 1978; Ray, 1968). The conditional nature of effects in this area, however, is clear when one looks at recent reviews (eg. Frey, 1986) which point to evidence in favour of the hypothesis, especially in field situations.

1.6.3 Channel variables

Channel variables concern the paths by which messages reach the receiver. Channel variables which have commonly been studied include personal and electronic presentations, verbal and non-verbal forms of messages and effect of presentations on different senses (e.g. sight and sound). The discussion here will center on the effect of non-verbal messages.

1.6.3.1 Non-verbal communication

Although the interpretation of the effects of non-verbal cues is complex (McGuire, 1985) there is evidence that perceived credibility is enhanced by postural asymmetries such as leaning to one side (Mehrabian, 1972). Source power appears to be enhanced by a face to face rather than oblique stance, by proximity (Dean, Willis & Hewitt., 1975; Jorgenson, 1975) and by vocal cues such as high participation and loudness (Robinson & McArthur, 1982) and avoidance of high pitch, qualifiers and hesitant speech (Erickson, Lind, Johnson & O'Barr, 1978; Apple et al., 1979).

1.6.4 Receiver variables

The study of receiver variables is concerned with the effects of the personal characteristics of the receiver of the message. The influence of age and sex have been commonly studied.

1.6.4.1 Age and sex

A number of studies have found that age has a non-monotonic inverted-U relationship to influencability (Eron, Heusmann, Brice, Fischer & Mermelstein, 1983; Ward & McGinnies, 1974; Barber & Calverley, 1963). Recent meta analyses on gender differences have suggested that females may be more influenceable than males, although the size of the differences are often small

(McGuire, 1985). The mechanisms underlying age and sex differences appear to be complex (McGuire, 1985).

1.7 THIS STUDY.

The foregoing analysis indicated that many of the major child health problems of today were the result of personal behaviours, especially of parents, and social conditions which supported these behaviours. The evidence suggested that parent education may be an important influence on child health and that hospitals can play a worthwhile role in child preventative health and illness control through parent education.

It was seen that the use of media, especially video taped materials, may have considerable potential in hospital based health promotion programs. The use of audiovisual presentations in hospital waiting rooms was frequently recommended in the health promotion literature. However, the effectiveness of such programs was poorly researched. An analysis of media approaches in hospitals, and elsewhere, and theoretical considerations identified approaches, and variables, which have been successfully employed elsewhere and therefore warrant inclusion within other health promotion projects using media.

1.7.1 Aim

Based on these considerations it was decided to determine whether parents can be educated (i.e. whether knowledge can be improved) about child health using video taped health programs in hospital waiting rooms. Whilst the study did not seek to test the applicability of any particular theory, but rather to apply the approaches and principles which have been found to be useful elsewhere to solve a practical problem using the media, implications of the results for theory will be reported.

1.7.2 Hypotheses

The hypotheses of the study are essentially based on practical considerations, although they are also affected by the theoretical and empirical expectations derived from the literature already reviewed. It is

hypothesised that adults exposed to the program (i.e. videotaped programs on child health) in the waiting rooms will have significantly greater knowledge regarding correct child health practices than adults not exposed to the program overall and both in the short (i.e. within one week from exposure), and longer (i.e. after two months delay from exposure), term. This hypothesis is represented by the following notation concerning null hypotheses and alternate hypotheses:

Overall

$H1_0 : M_{E(1+2)} = M_{NE(1+2)}$

$H1_1 : M_{E(1+2)} > M_{NE(1+2)}$

Short term

$H2_0 : M_{E(1)} = M_{NE(1)}$

$H2_1 : M_{E(1)} > M_{NE(1)}$

Longer term

$H3_0 : M_{E(2)} = M_{NE(2)}$

$H3_1 : M_{E(2)} > M_{NE(2)}$

Where: $H1_0$, $H2_0$ and $H3_0$ = null hypotheses

$H1_1$, $H2_1$ and $H3_1$ = alternate hypotheses

M_E = Mean score of the group exposed to the program

M_{NE} = Mean score of the group not exposed to the program

(1+2) = overall group i.e. in both short and longer terms combined

(1) = short term i.e. within one week from exposure

(2) = longer term i.e. after two month from exposure

It is also hypothesised that members of the target group (to be identified and being that group having poor information) exposed to the program will have significantly greater knowledge regarding correct child health practices than members of the target group not exposed to the program overall and in both the short (i.e. within one week from exposure), and longer (i.e. after two months from exposure), term. This hypothesis is represented by the

following notation concerning null hypotheses and alternate hypotheses:

Overall

$H4_0$: $M_{TE(1+2)} = M_{TNE(1+2)}$

$H4_1$: $M_{TE(1+2)} > M_{TNE(1+2)}$

Short term

$H5_0$: $M_{TE(1)} = M_{TNE(1)}$

$H5_1$: $M_{TE(1)} > M_{TNE(1)}$

Longer term

$H6_0$: $M_{TE(2)} = M_{TNE(2)}$

$H6_1$: $M_{TE(2)} > M_{TNE(2)}$

Where: $H4_0$, $H5_0$ and $H6_0$ = null hypotheses

$H4_1$, $H5_1$ and $H6_1$ = alternate hypotheses

M_{TE} = Mean score of the target group exposed to the program

M_{TNE} = Mean score of the target group not exposed to the program

(1+2) = overall group i.e. in both short and longer terms combined

(1) = short term i.e. within one week from exposure

(2) = longer term i.e. after two month from exposure

1.7.3 Size, and nature, of effects

The size of the effect to be expected, based on the review by Gatherer et al. (1977) on the effects of mass media on knowledge, is about 6% or less. Although Midgley and Macrae (1971) and Clarke et al. (1977) found larger effects on patient's knowledge following exposure to audio and visual media in waiting room settings, the poor design of these studies makes it difficult to generalise from the results.

1.7.4 Potential significance

The present study extends past research using media in hospital waiting rooms (Midgley & Macrae, 1971; Clarke et al., 1977) by the use of specially designed video taped health education programs aimed at selected target groups. The research design employed provides a better test of the impact of such an approach than has been employed previously.

The study provides the opportunity to assess a number of propositions cited in the literature, including the "knowledge-gap hypothesis" and the conditional nature of media impacts. Should the video taped health programs have their predicted effect, the programs will be of immediate practical value for use in parent education and the approach could well serve as a model for extension of the educational approach to other sites and settings.

1.7.5 Report format

A two phase research program was developed to test the hypotheses involving the following:

(1) Needs assessment

Briefly, this phase involved the development of a test of parent knowledge of child health; identification of target groups having poor knowledge and specification of knowledge areas for incorporation into video taped health programs. Details of this phase of the research are contained in Chapter 2.

(2) Program development, implementation and evaluation

This phase involved development of video programs based on the specification developed in the "Needs Assessment" phase and implementation of a field experiment to test the impact of the programs on parent knowledge of child health. Details are contained in Chapter 3. This chapter also contains a general discussion of the findings of the study as a whole, including their practical and theoretical implications. Chapter 4 presents the summary and conclusions of the study.

CHAPTER 2.

NEEDS ASSESSMENT

2.1 INTRODUCTION

The first phase in the present study involved the assessment of the need for information on child health amongst parents attending the waiting rooms of the Adelaide Children's Hospital. As there was no test of parent knowledge readily available, such a test was developed. The test was used to identify groups which had poor knowledge. Description of these groups and assessment of information deficits was used to develop a specification for the development of video programs.

2.2 METHODS

2.2.1 Test development

The Child Health Knowledge Test was developed using a method adapted from Macintosh and Morrison (1969). A description of the methods follows:

Stage 1 -- Development of the test specification

The domain of knowledge was defined as knowledge of child health practices and the definition of these practices was an operational one. The development of a test specification guided the selection of test items through a number of phases of increasing specificity. As a starting point a brief review of attendance data at the hospital was undertaken. This suggested a number of general child health problem areas which could be loosely rated in terms of their relative importance. Further information on the relative priority of child health problem areas was obtained from Jonas' (1976) detailed study of attendances at the hospital. The proportionality of questions to problem areas which was decided upon from this analysis was as follows:

Accidents	28%
Child development	20%
Nutrition	21%
Immunisation	15%
Dental health	3%
Mental health, hygiene and other health problems	13%.

Following this, a comprehensive study was made of the literature on child health and, in particular, curricula used to teach parents about caring for their children (see Appendix 1 for the sources which were consulted). This analysis suggested subgroups of concern within the major health problem areas listed above. Finally a group of specialists in health education curriculum development (from the Education Department of South Australia) and paediatricians from the hospital were consulted to identify specific child health problems and information needs of parents.

In this way a detailed specification schedule was compiled which indicated the specific items of information required for the test (see Appendix 2).

Stage 2 -- Writing the test items

The writing of the items based on the specification schedule was completed in consultation with the health education specialists and paediatricians referred to above. An extensive search was also undertaken throughout Australian and overseas books and journals for tests and test items which could be used (see Appendix 3 for the sources which were consulted). In this way a bank of over 450 questions was formed -- which included the 45 item test used by Chamberlin et al. (1979) at the University of Rochester.

Stage 3 -- Pretesting the items

The item bank was subjected to a number of different analyses in the process of selecting questions for the final test. Firstly, a manageable number of items (i.e. 103) were selected by the investigator, representing a cross section and coverage of the domain of knowledge. These questions were compiled into a test and administered to parents and paediatricians. Details of these evaluation methods follow.

2.2.1.1 Subjects

The subjects were drawn from the population of parents who had accompanied a child to the hospital and were sitting in the waiting room. A random sample of 270 parents was selected from the hospital attendance register during March, 1983. Seven subjects refused an interview.

Twenty three Adelaide paediatricians were also selected to check the correct answers to the test and for their assessment, on a rating scale 1-5 (low-high), of the importance of each item.

2.2.1.2 Apparatus

The draft test (see Appendix 4) was administered to the sample. Details of interviewer briefing and quality control measures used are presented in Appendix 5.

2.2.1.3 Procedures

Following selection of subjects from the hospital attendance register they were interviewed whilst in the waiting room. Subjects who did not speak English were interviewed by trained volunteers who were fluent in the subjects native tongue. The paediatricians were contacted personally and requested to carry out the tasks specified above.

Based on the responses to the test by subjects and paediatricians the following statistics were calculated for each item (see table 1): level of agreement between paediatricians as to the correct answer; average rating of importance as given by the paediatricians; item total correlation; item difficulty; and product of the item total correlation and average rating of importance as given by paediatricians.

Items on which less than 75% of the paediatricians agreed as to the correct answer and items which were rejected by paediatricians for various technical reasons (i.e. 21 items) were rejected from the test. The reliability of the remaining 82 item test was then calculated (see table 2). The product of the item total correlations and average ratings of importance as given by paediatricians were used to select the highest scoring 60 items (i.e. a further 22 items were discarded). Item difficulty of the remaining items was then examined and all items which were correctly answered by over 90% of the subjects were discarded (i.e. a further 13 items). Three items were than selected from the 22 previously discarded items and were added back into the final item pool so that it corresponded as closely as possible with the test

specification schedule and to ensure a spread of item difficulty. The final pool of 50 items was used to form a 36 question test (see Appendix 6) hereinafter referred to as the Child Health Knowledge Test. The reliability of this test was calculated (see Section 2.3.1).

2.2.2 Identification of target groups and information deficits among parents

2.2.2.1 Subjects

The population from which the subjects were drawn was parents who had accompanied a child to the hospital and were sitting in the waiting rooms. A random sample of 500 parents was drawn from the hospital attendance register during the month of November 1983 and 425 of these were contacted. All subjects contacted agreed to be interviewed. The demographic characteristics of the subjects are described fully in Appendix 7. The majority of the sample were female (89.8%); aged 30-39 years (42.9%); Australian born (63.2%); had left school aged less than 15 years (47.2%); were engaged in home duties (71.9%); had a low occupation status level according to Congalton's (1969) scale(55.3%); had 2 children (40%) and were married (76.3%). All subjects who were contacted agreed to be interviewed (i.e. 425 subjects).

2.2.2.2 Apparatus

The Child Health Knowledge Test (see Appendix 6) was administered to the sample. Details of codes used in the demographic section of the Test are presented in Appendix 8. Details of interviewer briefing and quality control measures used are presented in Appendix 5.

2.2.2.3 Procedures

During the week following attendance at the hospital the respondents were interviewed by trained volunteer interviewers either by telephone or home interview. Up to five attempts were made to contact subjects by telephone. For subjects who did not have a telephone connected, up to three home visits were made. In the event that no contact was made after these attempts a card was posted to the subject requesting them to telephone the interviewer (contact details for subjects are presented in Appendix 9). Subjects who did not speak

English were interviewed by trained volunteers who were fluent in the subjects' native tongues. Interviews took an average of 15 minutes to complete once the subject was contacted.

Target groups were identified on the basis of an assessment of the test scores of various demographic groups. A specification for the development of video programs was based on a consideration of the characteristics of the target groups, an assessment of the test items which were poorly completed by low scoring subjects and consideration of the literature on communication psychology reviewed in Chapter 1.

2.3 RESULTS

2.3.1 Test development

Table 1: Summary table of statistics from item analysis and responses from paediatricians -- 103 item test

Item number†	Level of agreement†† correlation(1)	Corrected item total	Importance rating (2)†††	1x2¥	Difficulty ø
1A	100	.37	3.3	1.21	22
1B	100	.36	3.3	1.20	19 *
2	100	.05	4.1	0.22	95
3A	100	-.09	2.9	-0.26	79
3B	100	.32	2.9	0.92	26 *
4A	x				
4B	x				
5	77	.20	2.7	0.53	49 *
6	82	.05	1.9	0.09	83
7	77	.33	2.4	0.79	92
8A	96	.23	3.8	0.88	92
8B	x				
8C	x				
8D	x				
9	100	.30	2.2	0.66	62 *
10	x				
11	100	.37	4.2	1.53	97
12A	77	.24	3.9	0.94	99
12B	x				
12C	x				
13	100	.28	3.9	1.10	85 *

† Question numbers are identified on the questionnaire (see Appendix 4).

†† Level of agreement between paediatricians as to the correct answer (x denotes items rejected by paediatricians for various technical reasons).

††† Average rating of importance for item as specified by paediatricians.

¥ Product of corrected item total correlation and importance rating.

ø Proportion of sample correctly identifying answer to item.

* Items selected for the 50 item test.

Table 1: Summary table of statistics from item analysis and responses from paediatricians -- 103 item test[1] (continued)

Item number†	Level of agreement††	Corrected item total correlation(1)	Importance rating (2)†††	1x2¥	Difficultyø	
14	82	.19	2.4	0.45	93	
15	x					
16	77	.13	3.8	0.49	38	*
17	77	.03	3.4	0.11	79	
18A	82	.19	3.4	0.64	22	
18B	82	.11	3.4	0.38	11	
18C	77	.19	3.4	0.65	4	
18D	77	-.03	3.4	-0.10	4	
19	x					
20A	91	.32	3.7	1.20	72	*
20B	82	.25	3.7	0.91	49	*
21A	x					
21B	91	.35	4.2	1.49	50	*
21C	86	.40	4.2	1.68	49	*
21D	91	.39	4.2	1.65	47	*
21E	77	.07	4.2	0.27	67	*
21F	91	.07	4.2	0.28	14	*
21G	86	.25	4.2	1.06	70	*
21H	86	.06	4.2	0.26	4	*
21I	x					
21J	91	-.13	4.2	-0.55	6	
21K	91	.02	4.2	0.09	6	
22A	86	.26	2.8	0.76	92	
22B	86	.24	2.8	0.68	91	
23	x					
24	77	.18	2.8	0.50	69	
25	86	.13	3.0	0.40	71	*
26	96	.22	2.9	0.65	84	
27	100	.45	4.3	1.94	80	*
28	96	.42	4.4	1.85	70	*
29	86	.13	3.2	0.43	88	
30	100	.18	4.2	0.77	97	
31	82	.42	3.7	0.55	65	
32	86	.30	3.6	1.09	84	
33	x					
34	100	.46	2.1	0.97	90	
35	82	.22	4.3	0.95	97	

† Question numbers are identified on the questionnaire (see Appendix 4).

†† Level of agreement between paediatricians as to the correct answer (x denotes items rejected by paediatricians for various technical reasons).

††† Average rating of importance for item as specified by paediatricians.

¥ Product of corrected item total correlation and importance rating.

ø Proportion of sample correctly identifying answer to item.

* Items selected for the 50 item test.

1 Note: items 21A-21K were counted twice -- once for correctly assessing that the disease was preventable by vaccination and once for assessing the correct number of treatments required for vaccination

Table 1: Summary table of statistics from item analysis and responses from paediatricians -- 103 item test (continued)

Item number†	Level of agreement††	Corrected item total correlation(1)	Importance rating (2)†††	1x2¥	Difficulty ø
36	86	.51	2.5	1.28	65 *
37	96	.56	2.7	1.51	66 *
38	96	.44	3.0	1.33	89 *
39	100	.51	3.8	1.92	86 *
40	100	.39	3.2	1.26	95
41	91	.16	3.5	0.55	78
42	96	.42	3.9	1.62	96
43	x				
44	77	.40	2.9	1.16	49 *
45	96	.41	4.0	1.62	88 *
46	100	.34	4.4	1.49	85 *
47	100	.25	3.4	0.87	94
48	96	.35	2.8	0.97	92
49	96	.39	3.3	1.29	95
50	100	.42	4.1	1.74	95
51	100	.37	4.2	1.56	87 *
52	x				
53	77	.22	3.2	0.72	48 *
54	100	.35	4.4	1.53	96
55	100	.12	2.6	0.32	67 *
56	100	.34	3.9	1.31	73 *
57	82	.39	2.4	0.95	58 *
58	100	.42	2.7	1.13	90
59	x				
60	x				
61	86	.13	2.7	0.36	64 *
62	96	.47	4.4	2.08	88 *
63	100	.46	3.3	1.51	91
64	82	.35	3.1	1.10	86 *
65	100	.49	4.0	1.94	67 *
66	96	.52	4.2	2.20	68 *
67	100	.44	3.2	1.41	74 *
68	96	.20	4.1	0.80	91
69	82	.21	2.4	0.50	67 *
70	96	.48	2.6	1.25	57 *
71	82	.20	2.9	0.59	65 *
72	100	.52	4.4	2.27	96
73	91	.47	3.9	1.85	63 *
74	96	.29	2.9	0.85	78
75	96	.30	3.0	0.89	91
76	96	.32	3.7	1.18	84 *

† Question numbers are identified on the questionnaire (see Appendix 4).

†† Level of agreement between paediatricians as to the correct answer (x denotes items rejected by paediatricians for various technical reasons).

††† Average rating of importance for item as specified by paediatricians.

¥ Product of corrected item total correlation and importance rating.

ø Proportion of sample correctly identifying answer to item.

* Items selected for the 50 item test.

Table 1: Summary table of statistics from item analysis and responses from paediatricians -- 103 item test (continued)

Item number†	Level of agreement††	Corrected item total correlation(1)	Importance rating (2)†††	1x2¥	Difficultyø
77	86	.15	3.3	0.51	42 *
78	x				
79	x				
80	x				

† Question numbers are identified on the questionnaire (see Appendix 4).
†† Level of agreement between paediatricians as to the correct answer (x denotes items rejected by paediatricians for various technical reasons).
††† Average rating of importance for item as specified by paediatricians.
¥ Product of corrected item total correlation and importance rating.
ø Proportion of sample correctly identifying answer to item.
* Items selected for the 50 item test.

Table 2 shows that the internal consistency of the 82 item test was high. The mean score of 56.20 represented an achievement level of 68.5% correct answers. The distribution of scores was negatively skewed and had a strong positive kurtosis.

Table 2: Test characteristics

Test	R(Alpha)	$\bar{X}$	S.D.	S.E.	Skewness	Kurtosis
82 item	.89	56.20	9.72	0.60	-1.18	2.59

The deletion of items from the 82 item test to form the 50 item Child Health Knowledge Test increased the overall internal consistency (R(Alpha)) of the test to .92.

2.3.2 Identification of target groups and information deficits amongst parents

2.3.2.1 Non-response

Of the 500 subjects selected for study, 75 could not be contacted, representing a non-response level of 15%.

Tables 3 and 4 show that there were significant differences between respondents and non-respondents on two of the four variables for which comparative data were available. Specifically, non-respondents were more

likely to have been present in the hospital waiting room early in the morning and late in the evening. They were also more likely to have incomplete health insurance cover.

Table 3: Comparison of respondents and non-respondents on available data

Variable	χ^2	df.
Time of arrival	31.19	5 *
Health status	31.68	3 *
Waiting room number	3.82	4 †
Residential location	8.39	5 †

* Significant at α = .05 (2-tailed test).

† See Appendix 10 for crosstabulation tables.

Table 4: Crosstabulation tables comparing respondents and non-respondents on time of arrival and health status

Variable	Non-respondents		Respondents	
	no.	%	no.	%
Time of arrival (24 hour clock)				
0 - 400	1	2	18	4
401 - 800	7	10	4	1
801 - 1200	28	41	153	36
1201 - 1600	19	28	143	33
1601 - 2000	4	6	73	17
2001 - 2400	9	13	39	9
Health status				
Medical	28	41	69	16
Hospital	14	21	50	12
None	3	4	31	7
Medical & hospital	23	34	273	65

2.3.2.2 Test considerations

Since the test development procedures were conducted on one sample of respondents and items were deleted from the original test the reliability statistics presented in table 2 may not have represented the true reliability of the final set of test items. The reliability of the final test was therefore calculated from the scores of the 425 respondents interviewed. The internal consistency of the final test (see table 5) was marginally higher than that calculated from the test development procedures (see Section 2.3.1).

Table 5: Test characteristics

Test	R(Alpha)	$\bar{X}$	S.D.	S.E.	Skewness	Kurtosis
82 item	.95	28.2	8.81	0.43	-0.66	-0.18

From figure 1 and table 5 it is clear that the distribution of knowledge test scores had a wide range, was unimodal, negatively skewed and slightly platykurtic.

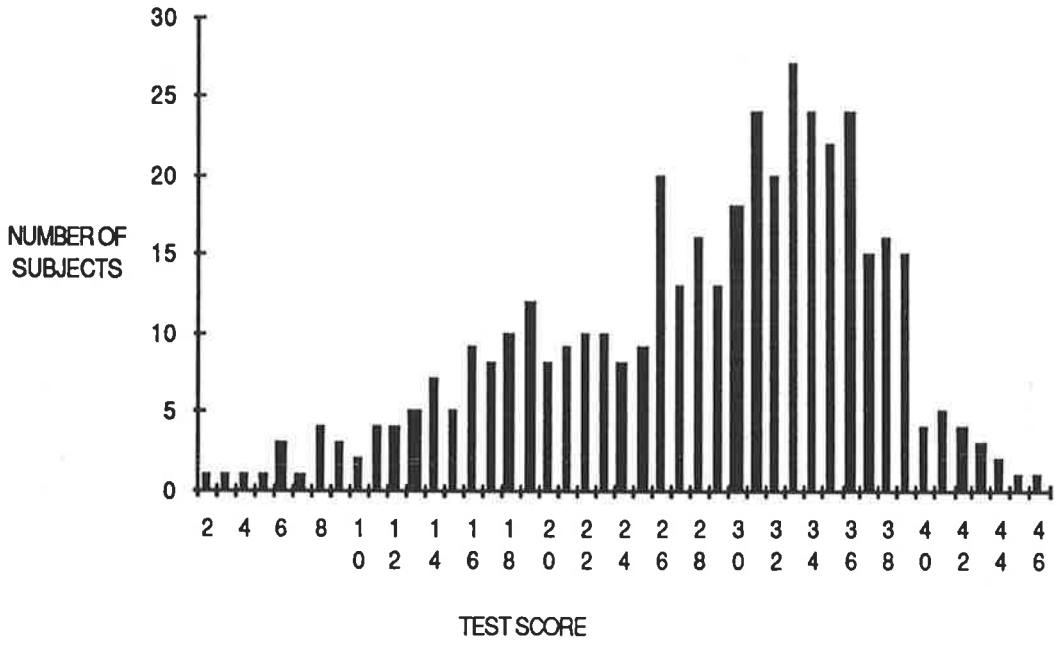

Figure 1: Distribution of scores on the Child Health Knowledge Test

2.3.2.3 Target group identification

From table 6 it is clear that there was a significant relationship between the demographic, and other independent variables chosen for study, and the knowledge test scores (i.e. the dependent variable) of the respondents. The independent variables in combination were strongly correlated with the dependent variable and explained 78.4% of the variation in the test scores. These statistics showed that at least one of the regression coefficients (B) was non-zero. Table 7 presents the results of significance tests for each regression

coefficient, arranged in order of the size of the regression coefficients (high - low) for those variables having a significant F ratio. A matrix of correlation coefficients is presented in Appendix 19.

Table 6: Regression analysis

Analysis of variance	df	Sum of squares	Mean square	F
Regression	20	65757.38	3287.87	6.57 *
Residual	477	18115.64	37.98	
Multiple R (.89)				
R^2 (.7840)				
Standard error (6.16)				

* Significant at $\alpha = .05$

Table 7: Results of significance tests for regression coefficients (B)

Variable	B	Beta	Standard error	F
Respondent's sex	5.56	0.32	0.86	41.65 *
Respondent's education	2.95	0.30	0.40	54.63 *
Respondent's occupation status	1.02	0.22	0.13	61.06 *
Respondent's country of birth	-1.92	-0.22	0.35	38.19 *
Respondent's age group	1.22	0.16	0.38	10.21 *
Spouse's occupation category	0.55	0.15	0.15	14.00 *
Respondent's occupation category	0.49	0.08	0.13	9.75 *
Respondent's length of residence (for foreign born)	0.48	0.07	0.23	4.42 *
Waiting room number	0.14	0.02	0.19	0.51
Health status	0.15	0.01	0.32	0.19
Marital status	-0.23	-0.02	0.41	0.32
Residential location	0.91E-01	0.01	0.23	0.16
Spouse's length of residence (for foreign born)	-0.14	-0.02	0.24	0.35
Time of attendance	-0.13	-0.01	0.25	0.29
Spouse's occupation status	-0.10	-0.02	0.15	0.47
Respondent's number of children	-0.11	-0.01	0.37	1.92
Spouse's education level	0.52	0.06	0.37	1.92
Spouse's sex	0.51	0.02	0.97	0.28
Spouse's country of birth	-0.32	-0.04	0.35	0.84
Spouse's age group	-0.46	0.07	0.36	1.68

* Significant at $\alpha = .05$

Eight of the variables studied had a significant regression coefficient (B). Recalculation of the overall F test based on these variables alone showed that they explained 77.91% of the variation in the test scores (see table 8) as compared to 78.4% for the complete set of demographic variables presented in table 24 (i.e. the full set of variables improved explanatory power by only 0.49% over the identified subset of variables).

Table 8: Regression analysis (for selected variables)

Analysis of variance	df	Sum of squares	Mean square	F
Regression	8	65345.54	8168.19	215.59*
Residual	489	18527.44	37.88	
Multiple R (.88)				
R2 (.7791)				
Standard error (6.16)				

* Significant at $\alpha = .05$

An examination of the test scores of subgroups within these variables demonstrated that low scoring groups (identified as the target groups) were respondents who were male; had low education level; low occupation status; low level occupation types; were foreign born (excluding Great Britain) -- especially those resident in Australia for less than six years; aged less than or equal to 24 years or 40-59 years and had spouses in low level occupation types (see tables 9 - 16).

Table 9: Respondent's sex by mean score

Sex	no	%	Mean score
Male	43	10.2	25.0
Female	379	89.8	28.6

Table 10: Respondent's education level by mean score

Level of schooling	no.	%	Mean score
Still at school	2	0.5	18.0
Never attended school or left under 15 years of age	126	30.2	21.4
Left school at 15 years or over	197	47.2	30.6
Trade, technical or other qualification	73	17.5	33.6
Tertiary qualification	18	4.3	31.5
Other	1	0.2	17.0

Table 11: Respondent's occupation status ranking [2] by mean score

Ocupation status rank	no.	%	Mean score
1 (high)	2	0.6	39.0
2	2	0.6	35.5
3	19	5.4	32.6
4	17	4.9	32.7
5	26	7.4	30.5
6	193	55.3	29.6
7 (low)	90	25.8	29.1

Table 12: Respondent's occupation category by mean score

Occupation category	no.	%	Mean score
Home duties	299	71.9	27.9
Retired	2	0.5	26.0
Unemployed	5	1.2	22.2
Student	5	1.2	32.2
Manual/domestic	27	6.5	26.0
Semi-skilled	12	2.9	21.3
Skilled	20	4.8	31.6
Clerical/sales/owner of small business	23	5.5	32.1
Middle management/middle professional/owner of medium sized business	19	4.6	32.2
Senior management/senior professional/owner of large business	4	1.0	36.3

Table 13: Spouses occupation category by mean score

Occupation category	no.	%	Mean score
Home duties	21	6.4	24.7
Retired	2	0.6	30.0
Unemployed	25	7.6	24.4
Student	5	1.5	25.4
Manual/domestic	52	15.8	25.8
Semi-skilled	55	16.7	26.9
Skilled	57	17.3	30.1
Clerical/sales/owner of small business	37	11.2	30.9
Middle management/middle professional/owner of medium sized business	57	17.3	33.0
Senior management/senior professional/owner of large business	19	5.8	37.6

2 Occupation status rankings were those developed by Congalton (1969)

Table 14: Respondent's country of birth by mean score

Country	no.	%	Mean score
Australia	266	63.2	29.6
Great Britain	62	14.7	31.5
Greece	18	4.3	17.8
Italy	33	7.8	22.8
Other European	26	6.2	25.5
Asian and other	16	3.8	21.2

Table 15: Foreign born respondent's (excluding Great Britain) length of residence by mean score

Length of residence (in years)	no.	%	Mean score
0-5	7	4.7	19.7
6-10	22	14.9	27.3
11-15	20	13.5	25.8
16-20	42	20.4	27.3
21-25	31	20.9	25.8
26-30	23	15.5	26.0
31+	3	2.0	26.7

Table 16: Respondent's age group by mean score

Age group (in years)	no.	%	Mean score
<20	8	1.9	16.9
20-24	53	12.6	27.4
25-29	98	23.3	28.7
30-39	180	42.9	28.9
40-49	67	16.0	27.7
50-59	13	3.1	26.4
60+	1	0.2	31.0

2.3.2.4 Identification of priority messages

In order to identify the priority messages for the video programs a comparison was made of the percentage of respondents who gave the correct answer for each item between two groups: one scoring less than or equal to the mean score for the subjects as a whole and the other scoring above the mean score (see figures 2 & 3 -- raw data are contained in Appendix 11).

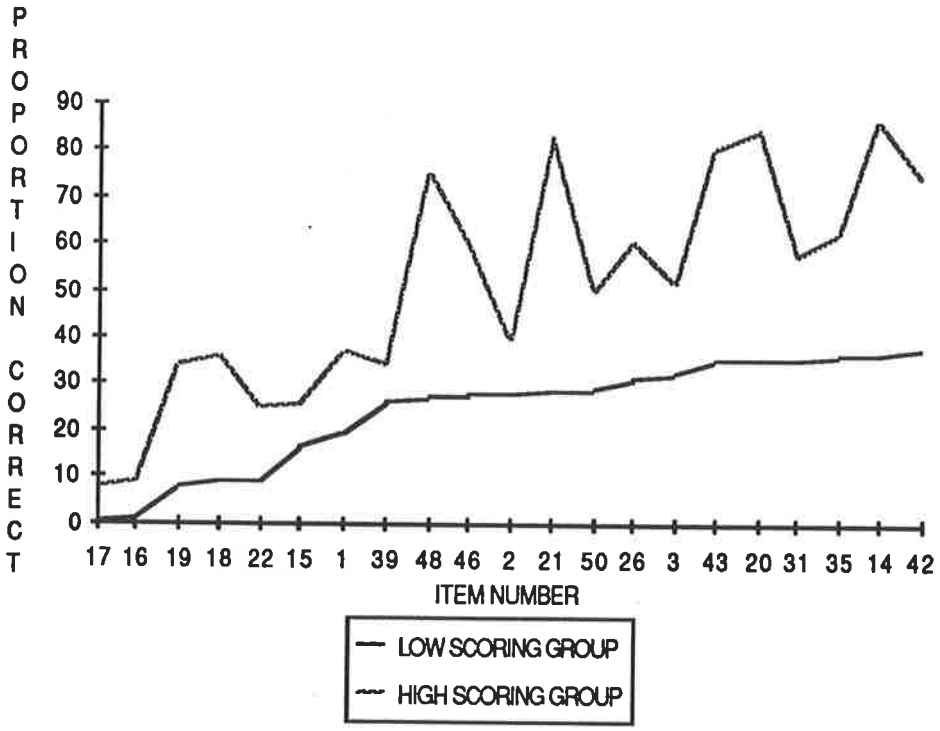

Figure 2: Proportion of subjects (low and high scoring) selecting correct answer to items -- for items scored correctly by less than 40% of the low scoring group

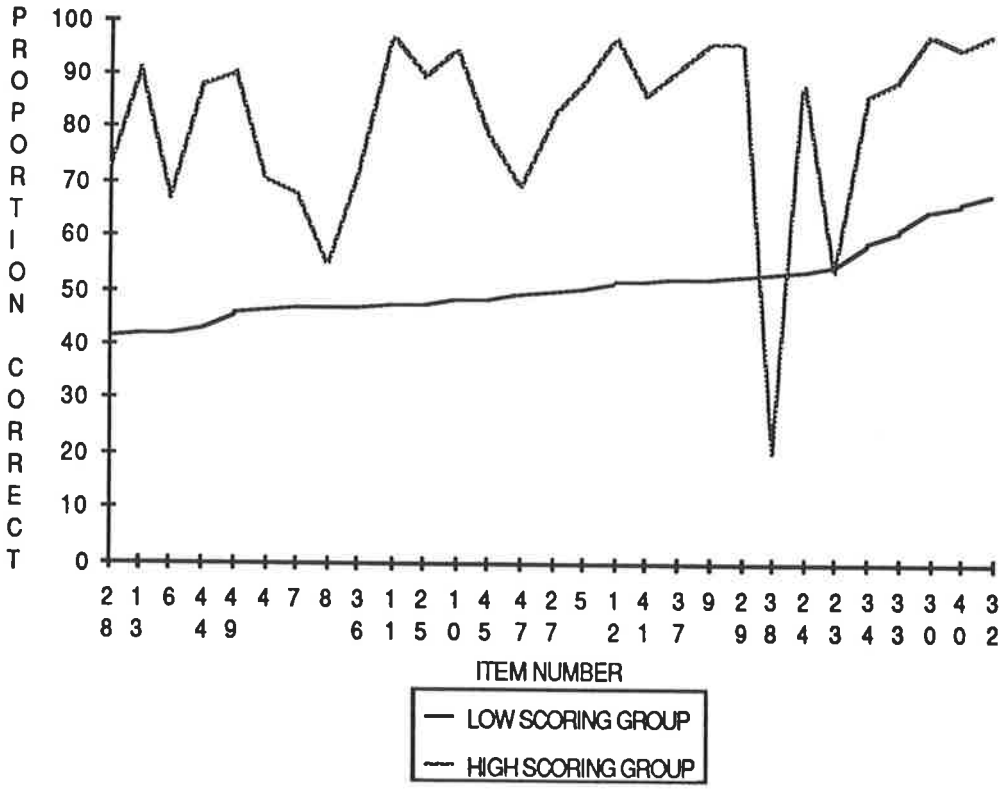

Figure 3: Proportion of subjects (low and high scoring) selecting correct answer to items -- for items scored correctly by greater than, or equal to, 40% of the low scoring group

Figures 2 and 3 show that on all but two items (i.e. items 23 and 38) the percentage of respondents who gave the correct answer was lower in the low scoring group compared with the high scoring group. The proportion of correct responses ranged from 0.5% to 67.9% for the low scoring group and only 30% of the items were responded to correctly by more than half the group. By comparison the proportion of correct responses for the high scoring group ranged from 8% to 97.9% and 80% of the items were responded to correctly by more than half the group. Items responded to correctly by less than 40% of the low scoring group were identified as priority messages. These messages primarily concerned knowledge of immunisation, accident prevention and first aid, child development, nutrition and matters of hygiene.

Based on a consideration of the priority messages and the demographic characteristics of the target groups a specification for the development of the video programs was produced (see Appendix 12).

2.3 DISCUSSION

The procedures used to develop the Child Health Knowledge Test produced a test with high content validity and reliability. It was considered that the test was of a level of measurement between ordinal and interval (Kirk, 1968). The distribution of test scores displayed some deviations from normality. However, they were not considered large enough to warrant the use of non-parametric statistics where the power-efficiency would be lower (Kerlinger, 1973).

Based on an analysis of the test scores of various demographic groups, target groups having poor information about child health were identified. They had the following characteristics: male; low education level; low occupation status; low level occupation types; foreign born (excluding Great Britain), especially those resident in Australia for less than six years; aged less than or equal to 24 years or 40-59 years; and had spouses in low level occupation types.

Whilst a comparison of the demographic characteristics of respondents and non-respondents revealed some differences on available data, it was

considered unlikely that the level of non-response (i.e. 15%) would have substantially affected the results nor the generality of the findings.

People having low education level and socio-economic status have often been the foci for health promotion programs and other educational programs (Burgess, 1979; Selge, 1975; McCune et al., 1984; Stevens, 1984; Murrell and Moss, 1977; Davis, 1966; McGuire, 1985; Gerbner et al., 1981; Johannsen and Engelsing, 1970; Richman and Urban, 1978). The formulation of the knowledge-gap hypothesis by Tichenor et al., (1970) was an attempt to explain the information deficits commonly found in these groups. In an attempt to overcome these deficits the present study identified knowledge items which would provide a focus for the development of video programs directed, in particular, at the low scoring target groups. A specification for the development of the programs was produced which included reference to the review of the literature on communications psychology presented in Chapter 1. The development of the programs and evaluation of their impact, once implemented, will be described in the next chapter.

CHAPTER 3

PROGRAM DEVELOPMENT, IMPLEMENTATION AND EVALUATION

3.1 Introduction

In order to test the hypotheses of the study, video programs were compiled, based on the results of the "Needs Assessment" study (see Chapter 2), to focus, in particular, on the low scoring target groups. These programs were implemented in a field experiment, controlled in such a way that the overall impact of the programs could be assessed, in addition to subgroup, and temporal effects.

Details of program development, implementation and evaluation are contained in this chapter. The chapter also contains a general discussion of the findings of the study as a whole, including reference to their practical and theoretical implications.

3.2 METHODS

3.2.1 Study design

Following the development of the specification for the video programs (see appendix 12) a series of video programs were developed by the Educational Resource Centre at the Adelaide Children's Hospital. Existing programs which were judged by the author to comply with the specification were also used (see Appendix 13 for a list of the programs used). In order to measure the impact of the video programs a posttest-only control group design was used, incorporating a time delay. A diagramatic representation of the design appears over the page.

Treatment group			Test time	
			1	2
Control group 1	R		O_{c1}	
Control group 2	R			O_{c2}
Experimental group 1	R	X	O_{e1}	
Experimental group 2	R	X		O_{e2}

The meaning of the symbols used in the diagram are presented below:

Test time1	=	tested within one week of presentation at the hospital
Test time2	=	tested after a two month delay after presentation at the hospital
R	=	random allocation of the condition to the day of the week
X	=	presentation of the video programs in the waiting rooms over a two month period
O_{c1}	=	observation of the control group at test time1
O_{c2}	=	observation of the control group at test time2
O_{e1}	=	observation of the experimental group at test time1
O_{e2}	=	observation of the experimental group at test time2

Since it was not possible to randomly allocate subjects to the conditions in the waiting room setting, randomisation was achieved through the random assignment of the conditions to days of the week. Over the period 9/4/84 - 13/8/84 days of the week were selected at random, using a table of random numbers, as program days (during which the video programs were played) and non-program days (during which no video programs were played).

In the control conditions normal television programs were played over the television sets located in the waiting rooms whilst in the experimental conditions the videotaped health programs were played.

The specification of the sample size requirements to detect a 6% increase in knowledge scores due to the program (as was expected from the review by Gatherer et al., 1977), with an alpha level of 0.05 and a power of 0.95, using the test characteristics specified in table 5, was defined by a formula presented by Snedecor and Cochran (1967). It was calculated that a sample of about 600 experimental and 600 control subjects would satisfy the requirements stated above (see Appendix 14).

Due to a limitation in resources it was decided to ensure enough subjects (i.e. at least 600 subjects) for a precise test of the differences between experimental and control groups, overall and at test time 1. However for the testing of the differences at test time 2 it was decided to relax the power requirements from 0.95 to 0.6 -- requiring a sample of about 200 in each group (see Appendix 14).

3.2.2 Subjects

3.2.2.1 Control group 1

During the non-program days a random sample of 600 parents who had accompanied a child to the hospital were selected from the hospital attendance register. The sample excluded 16 parents who had either revisited the hospital on a program day before being interviewed (so as to eliminate the possibility of contamination of the experimental effect) or had already been selected for one of the other treatment groups. These subjects were interviewed at their place of residence within a week of presentation at the hospital. [3]

All subjects who were contacted agreed to be interviewed (i.e. 577 subjects out of the 594 subjects selected).

3.2.2.2 Control group 2

During the non-program days a further random sample of 200 parents were selected from the attendance register -- excluding 13 parents who had either revisited the hospital on a program day before being interviewed or had already been selected for one of the other treatment groups. These subjects were interviewed at their place of residence after a two month delay after presentation at the hospital.[3]

All subjects who were contacted agreed to be interviewed (i.e. 191 subjects out of the 199 subjects selected).

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[3] In the processing of the questionaires of the control groups it was discovered that 7 of the subjects (6 from control group1 and 1 from control group2) had been interviewed twice due to procedural errors in the selection of subjects. The second questionaire for each of these subjects was discarded from the analyses. The total number of individuals selected for control groups 1 and 2 were therefore reduced to 594 and 199 respectively.

3.2.2.3 Experimental group 1

During the program days a random sample of 600 parents were selected from the attendance register. The sample excluded 7 parents who had already been selected for one of the other treatment groups. No attempt was made to control for revisiting of this group on other program, or non-program, days. A check on the attendance register showed that 3 of the selected subjects had revisited the hospital once, and 2 had revisited twice, during another program day before being interviewed.

All subjects who were contacted agreed to be interviewed (i.e. 542 [4] subjects out of the 600 subjects selected).

3.2.2.4 Experimental group 2

During the program days a further random sample of 200 parents were selected from the attendance register. The sample excluded 6 parents who had already been selected for one of the other treatment groups. No attempt was made to control for revisiting of this group on other program, or non-program, days. A check on the attendance register showed that 4 of the selected subjects had revisited the hospital once, 1 had revisited twice and 1 had revisited four times, during another program day before being interviewed.

All subjects who were contacted agreed to be interviewed (i.e. 186 subjects out of the 200 subjects selected).

3.2.3 Apparatus

3.2.3.1 Program implementation

The set of video programs developed for the study were designed to run for one and a half hours, from start to finish, and then to loop around and replay continuously 24 hours per program day.

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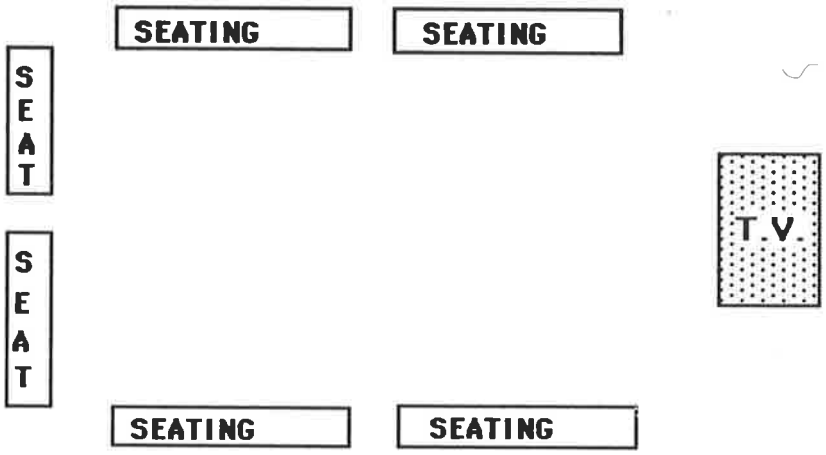
[4] Note: 36 of the 58 subjects recorded as non-respondents were in fact contacted, however, their questionnaires were lost in the post after being sent from the interviewer to the investigator. This explains the relatively high degree of non-response in experimental group 1.

The video unit was located in the Education Resource Centre at the hospital and a television set was located in each waiting room. The seating arrangements shown in the diagram over the page were made in each waiting room in order to focus attention on the television sets. No other attempt was made to draw the attention of the waiting room attendants to the television set and no indication was given to them that a research study was in progress.



3.2.3.2 Evaluation

Details of the interviewer briefing, and quality control, measures employed are presented in Appendix 5. The Child Health Knowledge Test is presented in Appendix 6. Coding lists for the demographic questions are contained in Appendix 8. A copy of the answer sheet, which was forwarded to subjects on request, after the interview, is presented in Appendix 15 (55.8% of all subjects interviewed requested a copy of this answer sheet).

3.2.4 Procedures

During the week following attendance at the hospital the subjects were interviewed by trained volunteer interviewers either by telephone or home interview. Up to five attempts were made to contact subjects by telephone. For subjects who did not have a telephone connected up to three home visits were made. In the event that no contact was made after these attempts a card was posted to the subject requesting them to telephone the interviewer (contact

details for subjects are presented in Appendix 16). Subjects who did not speak English were interviewed by trained volunteers who were fluent in the subject's native tongue. Interviews took an average of 15 minutes to complete once the subject was contacted.

3.3 RESULTS

3.3.1 Non-response

Of the 1593 subjects selected for study 1496 were contacted. All subjects who were contacted agreed to be interviewed. 97 subjects could not be contacted. The overall level of non response was therefore 6.1% of the selected subjects.

Table 17 shows that in two of the four variables for which comparative information was available (i.e. treatment group and residential location) there were significant differences between respondents and non-respondents. Further information on these differences is presented in Table 18. It is seen that there were proportionately more non-respondents in the experimental groups than in the control groups, although, the differences were greatly reduced if the 36 lost questionnaires, in the experimental group 1, were excluded from consideration. Table 18 also shows that there were proportionately more non-respondents in the northeastern and western subdivisions than in the other residential locations.

Table 17: Comparison of respondents and non-respondents on available data [5]

Variable	χ^2	df	Sig.
Treatment group	26.03	3	< .01 *
Waiting room	3.83	4	.43
Time of arrival	0.36	3	.95
Residential location	10.89	4	.03 *

* Significant at α = .05 (see Table 18 for crosstabulation tables).

[5] See Appendix 17 for crosstabulation tables for each variable for which results were not significant

Table 18: Crosstabulation tables comparing respondents and non-respondents on treatment group and residential location

Variable	Non-respondents		Respondents	
	no.	%	no.	%
Treatment group				
Control (time1)	17	2.9	577	97.1
Control (time2)	8	4.0	191	96.0
Experimental (time1)	58 [a]	9.7	542	90.3
Experimental (time2)	14	7.0	186	93.0
Residential location				
Para subdivision	8	4.6	186	95.9
North-east subdivision	22	7.1	290	92.9
Western subdivision	48	8.0	539	91.8
Eastern subdivision	14	3.8	347	96.1
Southern & outer Adel.	5	3.5	134	96.4

[a] 36 of these non-respondents were due to questionnaires being lost in the post.

3.3.2 Demographic characteristics of respondents in each treatment group

Table 19 shows that there were significant differences between the experimental and control groups on 3 of the 19 demographic variables studied. Further information on these differences is contained in Table 20. It can be seen that the proportion of respondents whose spouses were male was higher in both experimental groups than in either of the control groups. It is also seen that the proportion of respondents whose spouses were born in Australia was lower in both the experimental groups, especially experimental group 2, than in either of the control groups. However the size of the difference between the groups varied between countries of birth i.e. the differences were less pronounced for respondents born in Great Britain and Asian and other countries than for respondents born in Italy, Greece and other European countries. Table 20 also shows significant differences in the education levels of spouses although the differences were rather mixed, not showing a consistently higher, or lower, level of education in any particular group.

Table 19: Comparison of the demographic characteristics of respondents in each treatment group [6]

Variable	χ^2	df	Sig.	
Waiting room number	3.40	12	.99	
Time of arrival	14.55	9	.10	
Residential location	13.54	15	.56	
Sex (respondents)	3.08	3	.38	
Age (respondents)	9.53	15	.85	
Country of birth (respondents)	21.35	15	.13	
Number of years in Australia (foreign born respondents)	27.96	18	.06	
Education level (respondents)	6.69	12	.88	
Occupation status (respondents)	6.82	15	.96	
Occupation type (respondents)	14.18	18	.72	
Number of children (respondents)	10.70	12	.56	
Marital status (respondents)	13.36	15	.58	
Sex (spouses)	17.79	3	<.01	*
Age (spouses)	19.87	15	.18	
Country of birth (spouses)	26.55	15	.03	*
Number of years in Australia (foreign born spouses)	6.83	18	.99	
Education level (spouses)	17.02	9	.05	*
Occupation status (spouses)	10.37	18	.92	
Occupation type (spouses)	31.21	21	.07	

* Significant at $\alpha = .05$ (see Table 20 for crosstabulation tables).

[6] See Appendix 18 for crosstabulation tables for each variable for which results were not significant

Table 20: Crosstabulation tables comparing treatment groups on sex (spouses), country of birth (spouses) and education Level (spouses)

Variable	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Sex (spouses)								
Male	391	88.1	133	89.3	382	95.0	137	95.8
Female	53	11.9	16	10.7	20	5.0	6	4.2
Country of birth (spouses)								
Australia	239	53.8	74	49.0	173	43.7	52	36.6
Great Britain	51	11.5	21	13.9	48	12.1	21	14.8
Greece	20	4.5	9	6.0	27	6.8	13	9.2
Italy	43	9.7	18	11.9	59	14.9	19	13.4
Other European	46	10.4	13	8.6	56	14.1	24	16.9
Asian & other	45	10.1	16	10.6	33	8.3	13	9.2
Education level (spouses)								
Still at school, never attended, left < 15 yrs or other	107	24.1	46	30.7	123	30.8	44	30.8
Left school >15 yrs	177	39.9	64	42.7	143	35.8	57	39.9
Trade	99	22.3	24	16.0	66	16.5	18	12.6
Tertiary	61	13.7	16	10.7	67	16.8	24	16.8

3.3.3 Test Considerations

Table 21 shows that the internal consistency of the Child Health Knowledge Test was high. The test scores were distributed across a wide range (i.e. from 1-49 points out of a total of 50 points), having a largely unimodal distribution (see figure 1), with a small negative skew and a small negative kurtosis. The mean score of 27.09 represented an achievement level of 54.2% correct answers on the 50 item test.

Table 21: Test characteristics

R(Alpha)	$\bar{X}$	S.D.	S.E.	Skewness	Kurtosis
.90	27.09	9.38	0.24	-0.51	-0.35

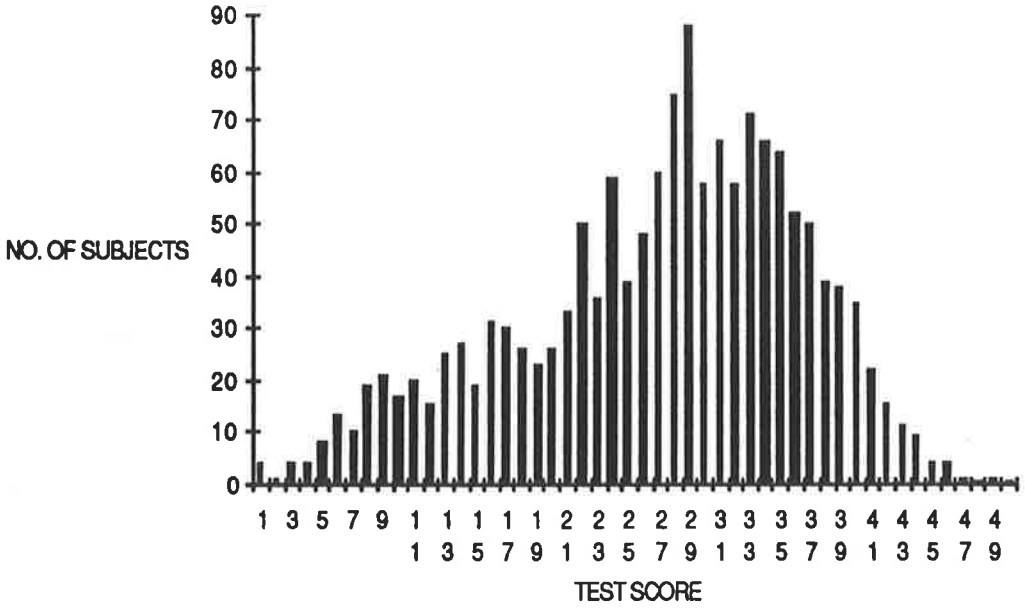


Figure 4: Distribution of scores on the Child Health Knowledge Test

3.3.4 Comparison of control conditions

Table 22 shows that the test scores of respondents in control groups 1 and 2 were not significantly different.

Table 22: Results of t-test comparing the test scores of respondents in control groups 1 and 2

Group	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
					t value	d.f.	2-tailed prob.
Control group 1	576[a]	26.41	9.35	0.39	0.59	765	.56
Control group 2	191	25.94	9.64	0.70			

[a] The test scores for one respondent were rejected due to coding problems

Table 23 shows that the test scores of respondents in control groups 1 and 2 were not significantly different for any of the target groups.

Table 23: Results of t-test comparing the test scores of target groups of respondents in control groups 1 and 2

Target group	Group	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t value	df	2-tailed prob.
Male	Control group 1	36	22.19	8.44	1.41	-0.49	52	.63
	Control group 2	18	23.39	8.40	1.98			
Low education level [a]	Control group 1	188	20.30	10.12	0.74	0.46	253	.65
	Control group 2	67	19.64	10.10	1.23			
Low occupation status [b]	Control group 1	526	26.05	9.47	0.41	1.54	693	.12
	Control group 2	169	24.76	9.50	0.73			
Low level occupation type [c]	Control group 1	491	25.72	9.51	0.43	1.10	653	.27
	Control group 2	164	24.77	9.71	0.76			
Low level occupation type (spouse) [d]	Control group 1	285	24.62	9.46	0.56	0.78	382	.44
	Control group 2	99	23.76	9.55	0.96			

[a] This group includes the following classes:
(1) still at school,
(2) never attended school or left under 15 years, and
(3) other.

[b] This group includes respondents in Congalton's (1969) occupation status ranking levels 5-7 inclusive.

[c] This group includes the following classes:
(1) home duties,
(2) retired,
(3) unemployed,
(4) manual and domestic labour and
(5) semi-skilled labour.

[d] This group includes respondents having spouses in the following occupations:
(1) home duties,
(2) unemployed,
(3) student,
(4) manual and domestic labour and
(4) semi-skilled labour.

Table 23: Results of t-test comparing the test scores of target groups of respondents in control groups 1 and 2 (continued)

Target group	Group	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t value	df	2-tailed prob.
Foreign born [a]	Control group 1	139	19.86	9.79	0.83	0.71	190	.48
	Control group 2	53	18.76	9.29	1.28			
Foreign born < 6 yrs. in Australia [b]	Control group 1	39	14.59	10.68	1.71	-0.39	56	.70
	Control group 2	19	15.68	8.60	1.97			
Target age groups [c]	Control group 1	185	24.29	9.21	0.68	0.67	239	.51
	Control group 2	56	23.32	10.54	1.41			

[a] This group includes the following countries of birth (excluding Australia and Great Britain):
(1) Greece,
(2) Italy,
(3) Other European and
(4) Asian and other countries.

[b] This group includes the following countries of birth (excluding Australia and Great Britain):
(1) Greece,
(2) Italy,
(3) Other European and
(4) Asian and other countries.

[c] This group includes respondents in the following age groups:
(1) < 20 years,
(2) 20-24 years,
(3) 40-49 years and
(4) 50-59 years.

3.3.5 Treatment effects

3.3.5.1 Control versus experimental groups

Data were analysed by an analysis of variance with Treatment vs. Control and Time 1/Time 2 as factors in a 2x2 factorial design. Table 24 shows that there was a significant main effect for treatment group, but not for test-time, and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall (see Table 25). It can be calculated that the mean score of the experimental group was 1.6 scale points (i.e. 6.24%) higher than control group overall.

Table 26 shows that the scores of the experimental group were significantly higher than those of the control group at test-time 1 but not at test-time 2. It can be calculated that the mean score of the experimental group was 1.87 scale points (i.e. 7.08%) higher than the control group at test-time 1, and 0.97 scale points (i.e. 3.74%) higher at test-time 2. Thus the major contribution to the overall higher scores of the experimental group was the effect of the experimental treatment at test-time 1.

Table 24: Results of an analysis of variance conducted on the treatment group and test-time

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	1014.14	1	1014.14	11.63	<.01*
Test-time	234.31	1	234.31	2.69	.11
Group x test-time	58.56	1	58.56	0.67	.41
Residual	130050.99	1491	87.22		
Total	131350.81	1494	87.92		

* Significant at $\alpha = .05$

Table 25: Summary statistics for experimental and control groups overall

Group	no.	$\bar{X}$
Experimental group	728	27.93
Control group	767	26.29

Table 26: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	542	28.28	9.26	0.40	-3.37	1116	<.01*
Control	1	576	26.41	9.35	0.39			
Experimental	2	186	26.91	9.23	0.68	-0.99	375	.16
Control	2	191	25.94	9.64	0.70			

* Significant at $\alpha = .05$

3.3.5.2 Treatment effects on target groups

As identified in Section 2.3.2.3 the target groups were identified as being respondents who were male, poorly educated, had low occupation status and low level occupation types, had spouses in manual or semi-skilled occupations, were foreign born, especially those resident in Australia for less than six years and were aged less than or equal to 24 years or 40 - 59 years. A summary of an analysis of the effects of the experimental treatment on these target groups follows.

The effects of the experimental treatment were assessed by separate analysis of variance tests for each target group. There were no significant interaction effects. Significant main effects for treatment group were found for each target group except for males. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall for each target group (except for males). The analysis of variance tests also showed significant main effects for test-time for respondents having low occupation status and low level occupation types. Comparison of the mean scores showed significantly higher scores overall at test-time 1 than at test-time 2 for these target groups.

Orthogonal comparisons were performed on treatment group by test-time combinations (i.e. experimental group versus control group at test-time 1 and experimental group versus control group at test-time 2) using T-tests. The test scores of respondents were found to be significantly higher in the experimental group than the control group at test-time 1 for all target groups other than males. However, significant differences (experimental group > control group) at test-time 2 were only found for respondents having spouses in low level occupation types and foreign born respondents, especially those resident in Australia for less than five years. Some large treatment effects were found for some target groups, especially at test-time 1.

Details of the results are presented in the following subsections.

(1) Male respondents

There were no significant main and interaction effects of treatment group and test-time. Table 27 shows that the scores of males in the experimental group were not significantly higher than those of males in the control group at test-time's 1 or 2.

Table 27: Results of t-tests comparing test scores of male respondents in control and experimental groups at time 1 and time 2

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	46	24.57	10.80	1.59	-1.08	80	.14
Control	1	36	22.19	8.44	1.41			
Experimental	2	15	25.80	11.30	2.92	-0.70	31	.24
Control	2	18	23.39	8.40	1.98			

(2) Respondents having low education level

Table 28 shows that there was a significant main effect for treatment group but not for test-time and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall, with the mean score of the experimental group 3.66 scale points (i.e. 18.18%) higher than the control group overall.

Table 29 shows that the scores of the experimental group were significantly higher than those of the control group at test-time 1 but not at test-time 2. It can be calculated that the mean score of the experimental group was 3.99 scale points (i.e. 19.66%) higher than the control group at test-time 1 and 2.64 scale points (i.e. 13.44%) higher at test-time 2.

Table 28: Results of an analysis of variance conducted on the treatment group and test-time for respondents having low education level

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	1762.63	1	1762.63	17.96	< .01*
Test-time	185.31	1	185.31	1.89	.17
Group x test-time	46.97	1	46.97	0.48	.49
Residual	51727.51	527	98.16		
Total	53739.52	530	101.40		

* Significant at $\alpha = .05$

Table 29: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for respondents having low education level

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	207	24.29	9.68	0.67	-4.01	393	<.01*
Control	1	188	20.30	10.12	0.74			
Experimental	2	69	22.28	9.80	1.18	-1.54	134	.06
Control	2	67	19.64	10.10	1.23			

* Significant at $\alpha = .05$

(3) Respondents having low occupation status

Table 30 shows that there were significant main effects for treatment group and test-time but no significant interaction effect. Comparison of the mean scores for treatment groups and test-time showed that the experimental group scored significantly higher than the control group overall and that the test scores were significantly higher at test-time 1 than at test-time 2, with the mean score of the experimental group 1.71 scale points (i.e. 6.64%) higher than the control group overall. It can also be calculated that the mean score at test-time 1 was 1.45 scale points (i.e. 5.69%) higher than at test-time 2.

Table 31 shows that the scores of the experimental group were significantly higher than those of the control group at test-time 1 but not at test-time 2. It can be calculated that the mean score of the experimental group

was 1.82 scale points (i.e. 6.99%) higher than the control group at test-time 1 and 1.46 scale points (i.e. 5.90%) higher at test-time 2.

Table 30: Results of an analysis of variance conducted on the treatment group and test-time for respondents having low occupation status

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	1006.69	1	1006.69	11.57	<.01*
Test-time	546.09	1	546.09	6.27	.01*
Group x test-time	8.14	1	8.14	0.09	.76
Residual	117152.51	1346	87.04		
Total	118693.50	1349	87.99		

* Significant at $\alpha = .05$

Table 31: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for respondents having low occupation status

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	488	27.87	9.17	0.42	-3.10	1012	<.01*
Control	1	526	26.05	9.47	0.41			
Experimental	2	167	26.22	9.16	0.71	-1.43	334	.08
Control	2	169	24.76	9.50	0.73			

* Significant at $\alpha = .05$

(4) Respondents having low level occupation types

Table 32 shows that there were significant main effects for treatment group and test-time but no significant interaction effect. Comparison of the mean scores for treatment groups and test-time showed that the experimental group scored significantly higher than the control group overall and that the test scores were significantly higher at test-time 1 than at test-time 2, the mean score of the experimental group was 1.85 scale points (i.e. 7.26%) higher than the control group overall. It can also be calculated that the mean score at test-time 1 was 1.38 scale points (i.e. 5.44%) higher than at test-time 2 overall.

Table 33 shows that the scores of the experimental group were significantly higher than those of the control group at test-time 1 but not at

test-time 2. It can be calculated that the mean score of the experimental group was 2.09 scale points (i.e. 8.13%) higher than the control group at test-time 1 and 1.19 scale points (i.e. 4.80%) higher at test-time 2.

Table 32: Results of an analysis of variance conducted on the treatment group and test-time for respondents having low level occupation types

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	1118.62	1	1118.62	12.72	< .01*
Test-time	473.35	1	473.35	5.38	.02*
Group x test-time	48.95	1	48.95	0.56	.46
Residual	113543.05	1291	87.95		
Total	115179.39	1294	89.01		

* Significant at $\alpha = .05$

Table 33: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for respondents having low level occupation types

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	478	27.81	9.20	0.42	-3.47	967	<.01*
Control	1	491	25.72	9.51	0.43			
Experimental	2	162	25.96	9.17	0.72	-1.14	324	.13
Control	2	164	24.77	9.71	0.76			

* Significant at $\alpha = .05$

(5) Respondents having spouses in low level occupation types

Table 34 shows that there was a significant main effect for treatment group but not for test-time and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall, with the mean score of the experimental group 2.45 scale points (i.e. 10.04%) higher than the control group overall.

Table 35 shows that the scores of the experimental group were significantly higher than those of the control group at test-time's 1 and 2. It can be calculated that the mean score of the experimental group was 2.20 scale

points (i.e. 8.94%) higher than the control group at test-time 1 and 3.15 scale points (i.e. 13.26%) higher at test-time 2.

Table 34: Results of an analysis of variance conducted on the treatment group and test-time for respondents having spouses in low level occupation types

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	1052.43	1	1052.43	11.76	<.01*
Test-time	24.69	1	24.69	0.28	.60
Group x test-time	30.08	1	30.08	0.34	.56
Residual	62668.57	700	89.53		
Total	63771.93	703	90.71		

* Significant at $\alpha = .05$

Table 35: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for respondents having spouses in low level occupation types

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	234	26.82	9.49	0.62	-2.64	517	<.01*
Control	1	285	24.62	9.46	0.56			
Experimental	2	86	26.91	9.30	1.00	-2.26	183	.01*
Control	2	99	23.76	9.55	0.96			

* Significant at $\alpha = .05$

(6) Foreign born respondents (excluding Great Britain)

Table 36 shows that there was a significant main effect for treatment group but not for test-time and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall. The mean score of the experimental group was 5.82 scale points (i.e. 29.75%) higher than the control group overall.

Table 37 shows that the scores of the experimental group were significantly higher than those of the control group at test-time's 1 and 2. It can be calculated that the mean score of the experimental group was 5.86 scale

points (i.e. 29.51%) higher than the control group at test-time 1 and 5.70 scale points (i.e. 30.40%) higher at test-time 2.

Table 36: Results of an analysis of variance conducted on the treatment group and test-time for respondents who were foreign born (excluding Great Britain)

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	3581.67	1	3581.67	37.08	<.01*
Test-time	121.25	1	121.25	1.26	.26
Group x test-time	0.51	1	0.51	0.01	.94
Residual	41051.20	425	96.59		
Total	44763.61	428	104.59		

* Significant at $\alpha = .05$

Table 37: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for foreign born respondents (excluding Great Britain)

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	173	25.72	9.78	0.74	-5.25	310	<.01*
Control	1	139	19.86	9.79	0.83			
Experimental	2	64	24.45	10.47	1.31	-3.08	115	<.01*
Control	2	53	18.75	9.29	1.28			

* Significant at $\alpha = .05$

(7) Foreign born respondents (excluding Great Britain) resident in Australia for less than six years

Table 38 shows that there was a significant main effect for treatment group but not for test-time and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall with the mean score of the experimental group was 9.89 scale points (i.e. 66.15%) higher than the control group overall.

Table 39 shows that the scores of the experimental group were significantly higher than those of the control group at test-time's 1 and 2. It can be calculated that the mean score of the experimental group was 10.75

scale points (i.e. 73.68%) higher than the control group at test-time 1 and 7.68 scale points (i.e. 48.98%) higher at test-time 2.

Table 38: Results of an analysis of variance conducted on the treatment group and test-time for foreign born respondents (excluding Great Britain) resident in Australia for less than six years

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	2730.66	1	2730.66	24.79	<.01*
Test-time	1.95	1	1.95	0.02	.89
Group x test-time	54.45	1	54.45	0.49	.48
Residual	12007.98	109	110.17		
Total	14824.55	112	132.36		

* Significant at $\alpha = .05$

Table 39: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for foreign born respondents (excluding Great Britain) resident in Australia for less than six years

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	41	25.34	11.39	1.78	-4.35	78	<.01*
Control	1	39	14.59	10.68	1.71			
Experimental	2	14	23.36	9.44	2.52	-2.43	31	.01*
Control	2	19	15.68	8.60	1.97			

* Significant at $\alpha = .05$

(8) Respondents in the target age groups (i.e. less than or equal to 24 years and 40 - 59 years)

Table 40 shows that there was a significant main effect for treatment group but not for test-time and that there was no significant interaction effect. Comparison of the mean scores for treatment groups showed that the experimental group scored significantly higher than the control group overall; the mean score of the experimental group was 2.88 scale points (i.e. 11.97%) higher than the control group overall.

Table 41 shows that the scores of the experimental group were significantly higher than those of the control group at test-time 1 but not at

test-time 2. It can be calculated that the mean score of the experimental group was 3.24 scale points (i.e. 13.34%) higher than the control group at test-time 1 and 1.87 scale points (i.e. 8.02%) higher at test-time 2.

Table 40: Results of an analysis of variance conducted on the treatment group and test-time for respondents in the target age group

Source of variation	Sum of squares	df	Mean square	F	Sig
Treatment group	955.00	1	955.00	10.23	<.01*
Test-time	220.17	1	220.17	2.36	.13
Group x test-time	39.07	1	39.07	0.42	.52
Residual	41906.13	449	93.33		
Total	43101.98	452	95.36		

* Significant at $\alpha = .05$

Table 41: Results of t-tests comparing test scores of respondents in control and experimental groups at time 1 and time 2 for respondents in the target age groups

Treatment group	Test time	no.	$\bar{X}$	S.D.	S.E.	Pooled variance estimate		
						t-value	df	1-tailed prob.
Experimental	1	159	27.53	9.78	0.78	-3.16	3422	<.01*
Control	1	185	24.29	9.21	0.68			
Experimental	2	53	25.19	9.90	1.36	-0.95	107	.17*
Control	2	56	23.32	10.54	1.41			

* Significant at $\alpha = .05$

The results of these analyses show, therefore the effect of the treatment, as a main effect, upon the knowledge of a number of sub-groups earlier identified to be less knowledgeable about the issue. We may examine the data another way, to examine the possible interaction of the treatment with target and non-target groups.

3.3.5.3 Comparison of treatment effects on target and non-target groups

In order to compare the effects of the experimental treatment on the target (low scoring) group and the non-target (high scoring) group (collectively referred to as the target subgroups), an analysis of variance was conducted for each target variable. Significant main effects were found for target sub-group

and for treatment group, but not for test-time, on all target variables. Comparison of the mean scores showed that the target group scored significantly lower than the non-target group for each target variable (see Table 42) as is intended from the specification of the target group. Comparison of the mean scores for treatment group, as previously indicated, showed higher scores for the experimental group than the control group (see Table 25).

Table 42: Mean scores for target subgroup and group for target variables

Target variable	Target subgroup	No.	Mean score
Sex	Male	115	23.00
	Female	1378	27.39
Education level	Low	531	22.03
	High	962	29.92
Occupation status	Low	1350	26.57
	High	142	32.26
Occupation type	Low level	1295	26.40
	High level	196	31.80
Spouses occupation type	Low level	704	25.51
	High level	433	31.32
Country of birth	Foreign born	429	22.77
	Non-foreign born	1057	28.88
Length of residence (for foreign born)	< 6 years	113	19.76
	6 + years	463	25.81
Age	Target age	453	25.42
	Non-target age	1040	27.85

Note. The target groups are cited first for each target variable.

The main effects for target groups were as follows for those analyses which failed to show an interaction: Sex, there were significant effects for target subgroup ($F= 16.37$, df 1, 1485, $p<.01$) and group ($F= 13.33$, df 1, 1485, $p<.01$); occupation type, there were significant effects for target subgroup ($F= 62.24$, df 1, 1483, $p<.01$) and group ($F= 15.49$, df 1,1483, $p<.01$); age, there were significant effects for target subgroup ($F= 21.29$, df 1, 1485, p,.01) and group ($F= 10.88$, df 1, 1485, $p<.01$).

Of more interest is that significant interactions were found between target sub-group and treatment group for the following target variables: education level; spouse's occupation type; country of birth; and length of residence (for

foreign born respondents). The analysis of variance tables are shown in Tables 43, 45, 47 and 49. Figures 5-8 plot the mean scores for target sub-group and treatment group interactions for the target variables listed above. These figures, and the Scheffe tests comparing the mean scores (see Tables 44, 46, 48 and 50), demonstrate that the non-target groups scored significantly higher than the target groups in the control condition. The treatment had no significant effect on the non-target group whilst it significantly improved the scores of the target group. That is there was a narrowing of the gap between the target and non-target groups as a result of the experimental treatment. Based on a comparison of the scores of target and non-target groups in the experimental and control treatments (see Tables 44, 46, 48 and 50) it can be calculated that initial differences between the groups were reduced by 26.76% for education; 30.71% for spouses occupation type; 56.84% for country of birth and 81.77% for length of residence -- for foreign born respondents (excluding Great Britain), as a result of the experimental treatment. Whilst differences between the groups after exposure to the experimental treatment were statistically significant for education, spouses occupation type and country of birth, the differences were not significant for length of residence -- for foreign born respondents (excluding Great Britain).

Table 43: Results of an analysis of variance conducted on the target subgroup, treatment group and test-time for the target variable -- education level

Source of variation	Sum of squares	df	Mean square	F	Sig
Target subgroup	21779.78	1	21779.78	302.37	< .01*
Group	1601.28	1	1601.28	22.23	< .01*
Test-time	223.83	1	223.83	3.11	.08
Target x group	515.14	1	515.14	7.15	.01*
Target x testtime	33.22	1	33.22	0.46	.50
Group x test-time	111.95	1	111.95	1.55	.21
Target x group x test-time	0.41	1	0.41	0.01	.94
Residual	106965.48	1485	72.03		
Total	130719.54	1492	87.61		

* Significant at $\alpha = .05$

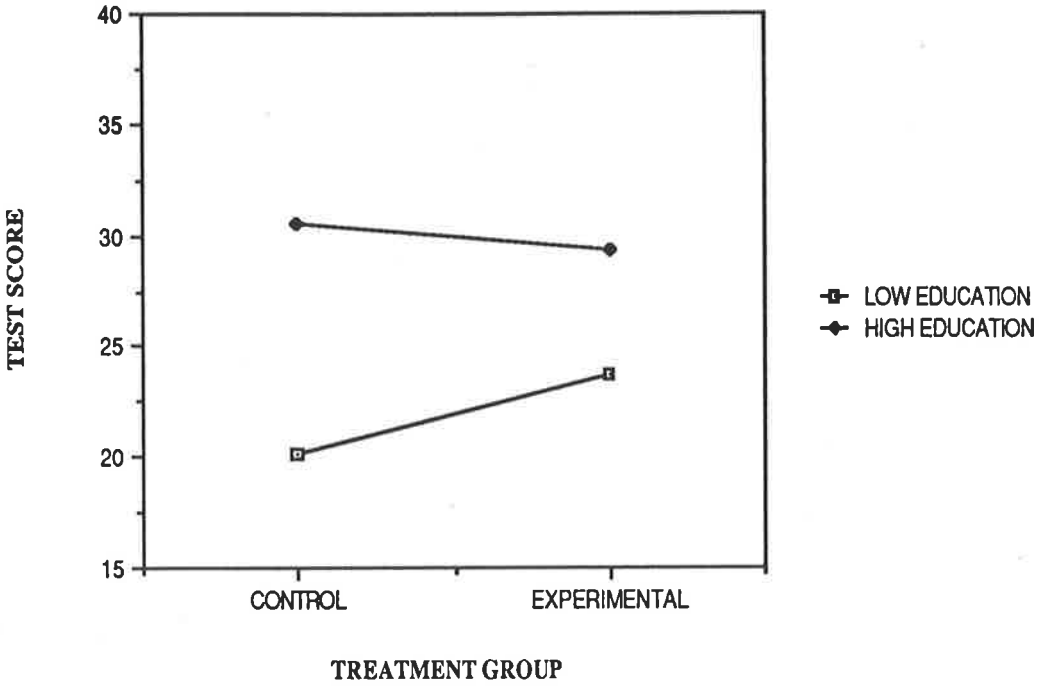


Figure 5: Mean scores for target sub-group and treatment group interactions for the target variable -- education level

Table 44: Results of a Scheffe test on target sub-group and group combinations for the target variable -- education

Combination no.	Target sub-group	Group	Mean	Combination no.			
				1	2	3	4
1	Target group	Control	20.13				
2	Target group	Experimental	23.79	*			
3	Non-target group	Control	29.36	*	*		
4	Non-target group	Experimental	30.55	*	*		

* Denotes a significant difference at α = .05. Ranges = 3.96. The actual value compared with Mean(j)-Mean(i) is: 6.0033 x Range x DSQRT(1/N(i) + 1/N(j)).

Table 45: Results of an analysis of variance conducted on the target subgroup, treatment group and test-time for the target variable -- spouses occupation type

Source of variation	Sum of squares	df	Mean square	F	Sig
Target subgroup	8726.66	1	8726.66	113.92	< .01*
Group	534.78	1	534.78	6.98	.01*
Test-time	124.60	1	124.60	1.63	.20
Target x group	535.71	1	535.71	6.99	< .01*
Target x testtime	37.97	1	37.97	0.50	.48
Group x test-time	15.31	1	15.31	0.20	.66
Target x group x test-time	196.04	1	196.04	2.56	.11
Residual	86485.82	1129	76.60		
Total	96981.73	1136	85.37		

* Significant at $\alpha = .05$

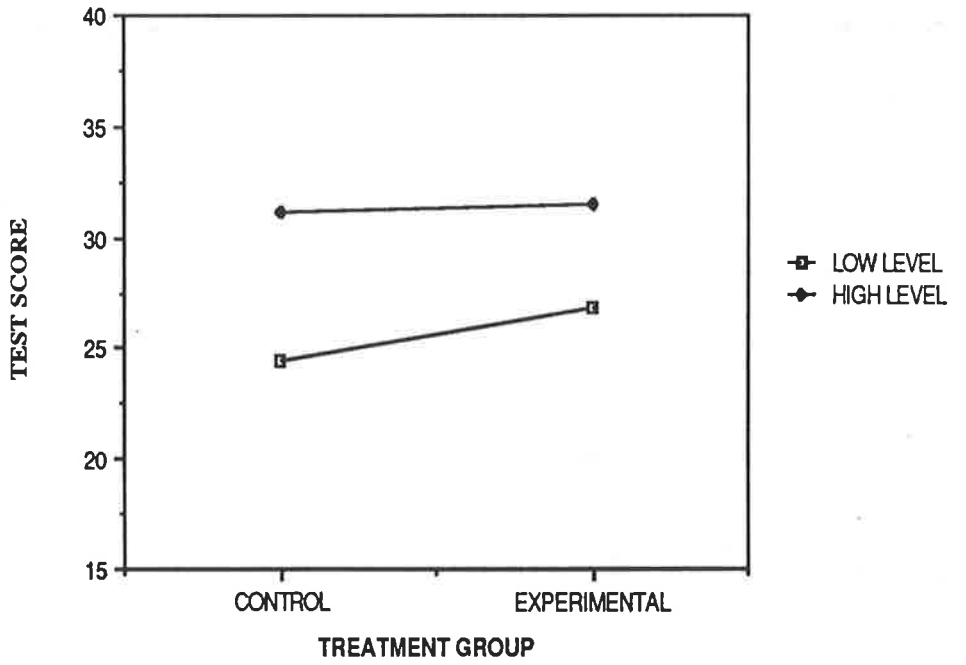


Figure 6: Mean scores for target sub-group and treatment group interactions for the target variable -- spouses occupation type

Table 46: Results of a Scheffe test on target sub-group and group combinations for the target variable -- spouses occupation type

Combination no.	Target sub-group	Group	Mean	Combination no.			
				1	2	3	4
1	Target group	Control	24.40				
2	Target group	Experimental	26.85	*			
3	Non-target group	Control	31.14	*	*		
4	Non-target group	Experimental	31.52	*	*		

* Denotes a significant difference at α = .05. Ranges = 3.96. The actual value compared with Mean(j)-Mean(i) is: 6.1914 x Range x DSQRT(1/N(i) + 1/N(j)).

Table 47: Results of an analysis of variance conducted on the target subgroup, treatment group and test-time for the target variable -- country of birth

Source of variation	Sum of squares	df	Mean square	F	Sig
Target subgroup	11984.41	1	11984.41	154.66	< .01*
Group	1756.58	1	1756.58	22.67	< .01*
Test-time	150.51	1	150.51	1.94	.16
Target x group	1984.19	1	1984.19	25.61	< .01*
Target x testtime	21.13	1	21.13	0.27	.60
Group x test-time	83.94	1	83.94	1.08	.30
Target x group x test-time	26.81	1	26.81	0.35	.56
Residual	114529.04	1478	77.49		
Total	129911.32	1485	87.48		

* Significant at α = .05

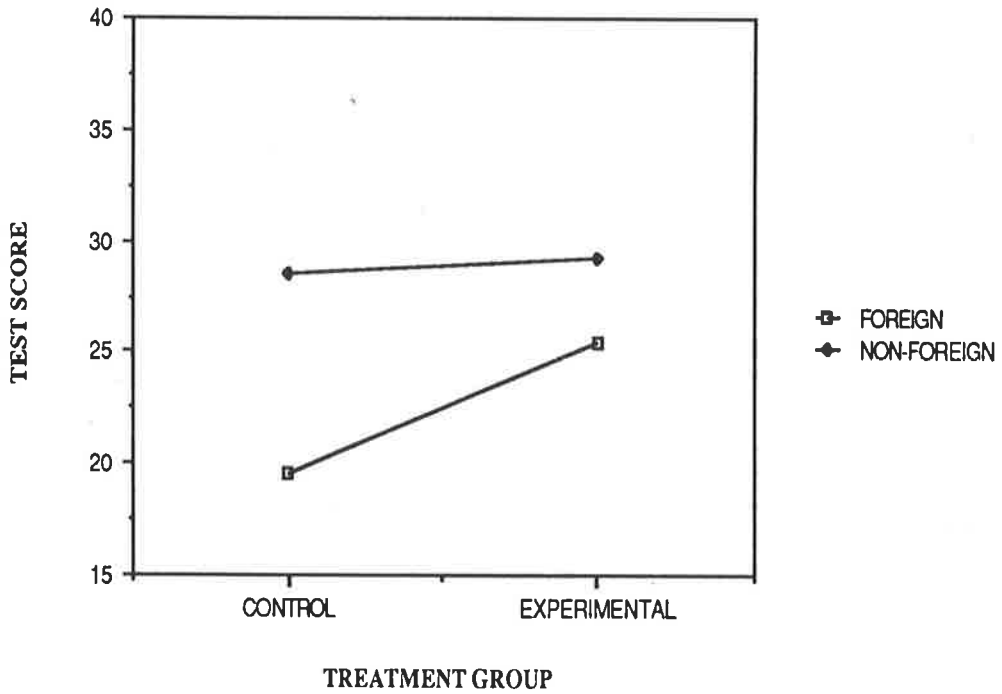


Figure 7: Mean scores for target sub-group and treatment group interactions for the target variable -- country of birth

Table 48: Results of a Scheffe test on target sub-group and group combinations for the target variable -- country of birth

Combination no.	Target sub-group	Group	Mean	Combination no.			
				1	2	3	4
1	Target group	Control	19.56				
2	Target group	Experimental	25.38	*			
3	Non-target group	Control	28.55	*	*		
4	Non-target group	Experimental	29.26	*	*		

* Denotes a significant difference at α = .05. Ranges = 3.96. The actual value compared with Mean(j)-Mean(i) is: 6.2237 x Range x DSQRT(1/N(i) + 1/N(j)).

Table 49: Results of an analysis of variance conducted on the target subgroup, treatment group and test-time for the target variable -- length of residence (for foreign born respondents)

Source of variation	Sum of squares	df	Mean square	F	Sig
Target subgroup	3127.44	1	3127.44	33.74	< .01*
Group	1618.03	1	1618.03	17.45	< .01*
Test-time	151.74	1	151.74	1.64	.20
Target x group	1487.55	1	1487.55	16.05	< .01*
Target x testtime	14.10	1	14.10	0.15	.70
Group x test-time	24.36	1	24.36	0.26	.61
Target x group x test-time	33.13	1	33.13	0.36	.55
Residual	52655.08	568	92.70		
Total	59291.49	575	103.12		

* Significant at α = .05

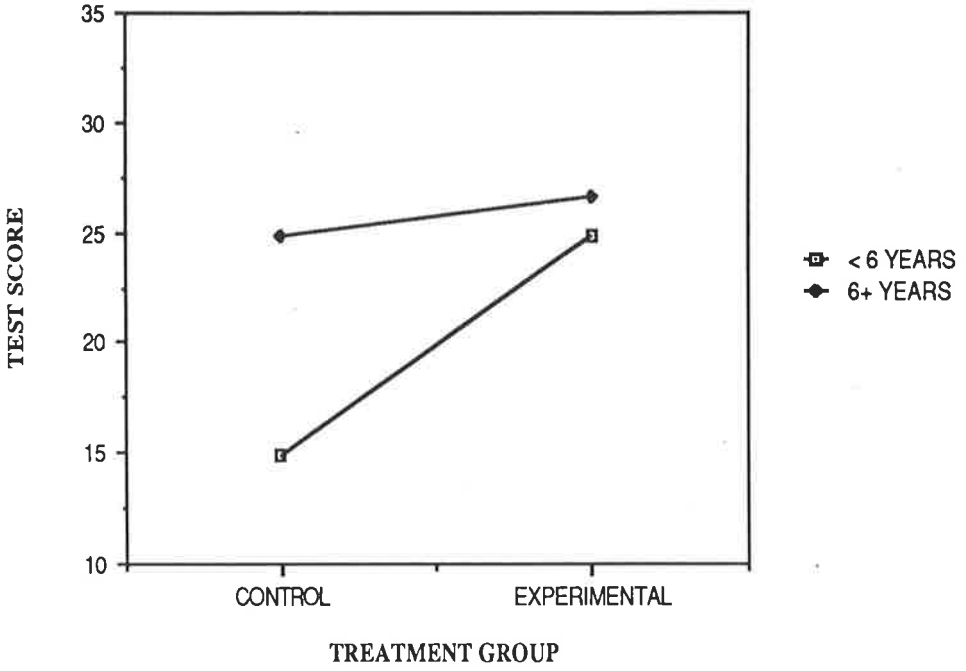


Figure 8: Mean score for target sub-group and treatment group interactions for the target variable -- length of residence (for foreign born respondents)

Table 50: Results of a Scheffe test on target sub-group and group combinations for the target variable -- length of residence (for foreign born)

Combination no.	Target sub-group	Group	Mean	Combination no.			
				1	2	3	4
1	Target group	Control	14.95				
2	Target group	Experimental	24.84	*			
3	Non-target group	Control	24.88	*			
4	Non-target group	Experimental	26.65	*			

* Denotes a significant difference at α = .05. Ranges = 3.96. The actual value compared with Mean(j)-Mean(i) is: 6.7968 x Range x DSQRT(1/N(i) + 1/N(j)).

Table 51 shows that there was a significant interaction between target subgroup and test-time for the target variable -- occupation status. Figure 9 and Table 52 indicate that the non-target group scored significantly higher than the target group at test-times 1 and 2, and that the difference between these target subgroups was higher at test-time 2 than at test-time 1, the one case where there was a divergence between the target and non-target groups over time.

Table 51: Results of an analysis of variance conducted on the target subgroup, treatment group and test-time for the target variable -- occupation status level

Source of variation	Sum of squares	df	Mean square	F	Sig
Target subgroup	4204.30	1	4204.30	50.08	< .01*
Group	1046.29	1	1046.29	12.46	< .01*
Test-time	306.41	1	306.41	3.65	.06
Target x group	3.83	1	3.83	0.05	.83
Target x testtime	437.89	1	437.89	5.22	.02*
Group x test-time	46.67	1	46.67	0.56	.46
Target x group x test-time	126.59	1	126.59	1.51	.22
Residual	124573.53	1484	83.94		
Total	130704.41	1491	87.66		

* Significant at $\alpha = .05$

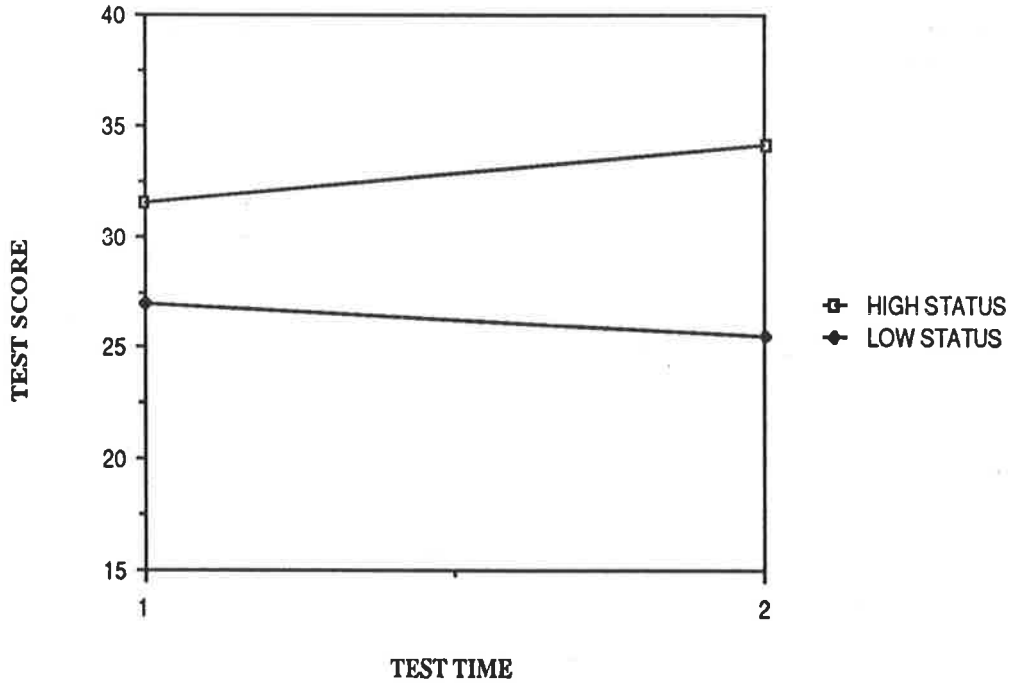


Figure 9: Mean score for target sub-group and test-time interactions for the target variable -- occupation status

Table 52: Results of a Scheffe test on target sub-group and test-time combinations for the target variable -- occupation status

Combination no.	Target sub-group	Test-time	Mean	Combination no.			
				1	2	3	4
1	Target group	1	26.93				
2	Target group	2	25.48				
3	Non-target group	1	31.52	*	*		
4	Non-target group	2	34.10	*	*		

* Denotes a significant difference at α = .05. Ranges = 3.96. The actual value compared with Mean(j)-Mean(i) is: 6.5021 x Range x DSQRT(1/N(i) + 1/N(j)).

3.4 DISCUSSION

3.4.1 Design and execution of the study

The success of any research study is determined to a large extent by the design employed and the quality of execution. The control of extraneous variables is of paramount importance, especially in a field experiment where a wide range of potentially biasing variables may be operating simultaneously with the experimental treatments.

Field experiments have a number of unique virtues. Kerlinger (1973) argues that the variables in a field experiment usually have a stronger effect than those of laboratory experiments and that the effects are often strong enough to penetrate the distractions of experimental situations. He argues that realism increases the strength of the variables and contributes to external validity, since generalisations to other situations are likely to be more valid when based on a study set in a realistic situation. He also considers that field experiments are well suited to the solution of practical problems and to the testing of broad hypotheses which are easy to operationalise, and yet are difficult, if not impossible, to create in a laboratory. The main weaknesses of field experiments are generally practical. Manipulation of the independent variable and randomisation are probably the two most important problems.

In the present study manipulation of the independent variable may have been achieved at the expense of true randomisation. The essence of randomisation is the assignment of subjects to treatments in such a way that every member of the population under study has an equal probability of being chosen for any particular treatment. In assigning treatments, at random, to days of the week the probability of a particular person being assigned to the experimental or control group was dependent on, among other things, the probability of going to the hospital on that particular day. Insofar as different client types may vary in their probability of going to the hospital on any particular day the probability of assignment to the experimental or control

groups varies. However, since there is no evidence of a variation in parenting knowledge over the days of the week, and a relatively large number of days were covered by the study period, it is likely that the assignment of treatments to days of the week approximated true randomisation. Indeed it can be argued that since attendance at a casualty department is due largely to factors outside of the control of the individual parent, especially attendances as a result of accidents, then there is no reason to expect that parents attending on any particular day will be different from parents attending on any other day.

Confidence that randomisation was achieved, and that the experimental and control groups were equal on relevant characteristics before exposure to the experimental manipulations, is increased by a number of observations. First, the demographic characteristics of the respondents in each group were comparable on all but three variables out of the 19 variables studied and none of these three variables was found in the "Needs Assessment" study (see Section 2.3.2.3) to explain a significant proportion of the variability in test scores between subjects. Such differences may also have been due to chance, given the number of comparisons made. Second, as shown in tables 6 and 7, the test scores of subjects in the two control groups were not significantly different overall or for any of the target groups. It is therefore probable that the test scores of the experimental groups were similar to those of the control groups prior to exposure to the experimental treatment. Of course the absence of pretesting makes it difficult to know for sure whether the groups were actually equal on test scores prior to exposure. Pretesting was ruled out in the experiment due to its likely reactive effect and difficulty in administration in the waiting room setting.

3.4.1.1 Threats to internal validity

Campbell and Stanley (1966) have presented a useful discussion of the weaknesses of experimental designs used in field experiments. They spelt out 12 factors jeopardizing the validity of the designs i.e. history, maturation, testing, instrumentation, statistical regression, selection, experimental

mortality, interactions of the previous seven factors, reactive effects of testing, interaction of selection biases and the experimental variable, reactive effects of experimental arrangements, and multiple-treatment inference. Following the discussion of Campbell and Stanley (1966) it is considered that the design employed in the present study controlled for most of the sources of invalidity. A brief discussion of the principal sources of possible invalidity in the design follows.

(1) History

The effects of history were controlled for in the comparisons taking place within approximately the same time delay following exposure to the experimental treatments (e.g. experimental group vs. control group at test-time 1 and experimental group vs. control group at test-time 2) but not for comparisons taking place at different time delays (e.g. experimental group at test-time 1 vs. experimental group at test-time 2 and control group at test-time 1 vs. control group at test-time 2). It is possible that extraneous variables may have intervened during the time delay between test-time1 and test-time2.

Confidence that the history effect was not strong is increased by the lack of a significant or sizeable difference between the test scores of control groups 1 & 2 (see table 6) and by the absence of any known programs occurring during the period of the study which might have differentially affected the test scores of subjects tested at times 1 & 2.

(2) Maturation

Campbell and Stanley (1966) use the term maturation to cover all of those biological or psychological processes which systematically vary with the passage of time, independent of specific external events. As with the history effects, it is considered that the effects of maturation were controlled for in comparisons taking place within approximately the same time delay following exposure to the experimental treatments but not for comparisons taking place at different time delays. However it is considered that maturation effects (e.g.

the gaining of more experience in parenting), over the two month period between test-time 1 and test-time 2, would have been insignificantly small.

Confidence that the maturation effect was not strong is increased by the lack of a significant or sizeable difference between the test scores of control groups 1 & 2 (see table 6 and 7).

(3) Selection

Selection bias is the most likely source of invalidity, and potentially potent in effect, in experiments which do not employ random sampling and random assignment. It is especially difficult to disprove in studies, such as the present one, where pretesting was absent.

However, it has been argued above that randomisation was probably achieved in this study. It is therefore argued that selection bias was probably small, at least in regard to the measurement of differences in knowledge between conditions. In any event there is no reason to expect that any bias would have amplified the effects of the experimental groups compared with the control groups. It could equally have acted in the reverse i.e. to reduce the size of the experimental treatment effects.

(4) Experimental mortality

Campbell and Stanley (1966) defined experimental mortality as "the production of..... (comparison group) differences.....due to the differential drop-out of persons from groups." One measure of mortality in field experiments which employ survey techniques for data collection is non-response.

Comparison of respondents and non-respondents showed significant differences on two of the four variables for which comparative data were available. These differences may be indicative of further systematic differences between respondents and non-respondents, which could be a cause for concern, especially considering the differential response rates between experimental and control groups. However, these differences may have been in factors unrelated to the test scores. Indeed the variable

"residential location" was not found in the "Needs Assessment" study to be related to the differences in test scores between subjects (see Section 2.3.2.3). Furthermore, it appears that there was no consistency between the present study and the "Needs Assessment" study in relation to the variables showing significant differences between respondents and non-respondents i.e. in the latter study significant differences were found for time of arrival but not for waiting room number nor for residential location. The differences shown between respondents and non-respondents in this study may therefore represent chance findings.

There is some support for the argument that non-response probably had a negligible effect on group differences. First, the overall level of non-response in each group was low and all subjects who were actually contacted agreed to be interviewed. Second, in spite of differential non-response, the demographic characteristics of the groups were similar in the majority of variables. Thirdly, the equivelance of the test scores of the subjects in the two control groups (see table 6) which had different levels of non-response (see table 2) suggests that non-response may not have been related to test scores i.e. non-respondents may not have been any more, or less knowledgable, than respondents.

(5) Interaction of the treatment and history

Although it has been argued above that history effects were small this does not discount the possibility of an interactive effect of the treatment and history, especially for the experimental groups where exposure to the health programs may have sensitized the subjects to further health information for some time. The operation of such an interactive effect confuses the interpretation of the pure effect of the experimental treatments. However, such an effect is, from a practical viewpoint, highly desirable, representing the longer term influence of the treatment.

(6) Diffusion of treatments

Cook and Campbell (1979) have suggested that diffusion of treatments is an acute problem in quasi-experiments, where respondents in one treatment group may learn from respondents in another. In the present study it is, however, unlikely that this effect was substantial. As indicated in Section 3.2.2 the frequency of re-visiting of subjects during other program days was very low. Therefore the opportunities for treatment groups to interact in the hospital setting were small.

(7) Compensatory rivalry and differential demoralization

The effects of compensatory rivalry and differential demoralization have been identified by Cook and Campbell (1979) as reactions to public assignment of subjects to conditions and obtrusive experimentation. Such effects are considered to be small in the present study because subjects were not made aware that a study was in progress and were unlikely to have guessed that the television programs were being manipulated for the study.

3.4.2 Test considerations

Table 5 shows that the test had a high internal consistency (i.e. R(Alpha) = .897), which was marginally lower than those of the "Needs Assessment" study where R(Alpha) values of .954 and .920 were found -- see Sections 2.3.1 & 2.3.2.2.

Analysis of the distribution of the test scores showed that, as found in the "Needs Assessment" study (see Sections 2.3.1 & 2.3.2.2), there was a negative skew and a small kurtosis. However the size of the departures from normality were not large enough to warrant the use of non-parametric statistics for group comparisons. Furthermore the scale itself was considered to be at a level of measurement between ordinal and interval and as Kirk(1968) says "If a level of measurement greater than ordinal but less than interval is achieved, an experimenter may choose to use a parametric test to take advantage of the additional information that is available (p492)."

The sample sizes employed ensured adequate precision and sensitivity for detection of an overall difference between experimental and control groups, overall and at test-time 1. However, for comparisons of experimental and control groups at test-time 2 the power of the test was quite low (see Appendix 14).

3.4.3 Experimental effects

3.4.3.1 Control vs. experimental groups

The statistical analysis conducted in Section 3.3.5.1 showed that the subjects in the experimental group scored significantly higher than subjects in the control group overall. The size of the difference between the groups was not large with respect to scale points (i.e. 1.6 points). However, on a percentage basis, it is considered that the 6.1% difference in mean scores is worthwhile especially when it is considered that the higher scores of the experimental group were due to, what was for most subjects in the experimental group, the viewing of part of one of the health programs for between 10-20 minutes (based on average waiting room times) on one occasion, and testing at between one week and two months delay proceeding exposure.

Retention of the health messages was however not strong. Whilst the short term effect of the experimental treatment was significant, the mean scores being 1.87 scale points (i.e. 7.08%) higher than the control group, the longer term effect, after a delay of two months (i.e. a difference of 0.97 scale points or 3.74%), was insignificant. It can be calculated that the the initial effect of the exposure was reduced by over half within two months.

Gatherer et al. (1979), in a detailed review of nearly 50 studies on the effects of media in health promotion found reported knowledge changes of 6% or less in studies where knowledge change was evaluated. Small overall effects appear to be the norm in relation to media programs (Katz & Feldman, 1962; Patterson & McClure, 1976; Sears & Chaffee, 1979) although as will be seen in the next section larger effects have been found in this and other studies on certain population subgroups under certain conditions.

3.4.3.2 Effects on target sub-groups

It will be remembered from Section 2.3.2.3 that target variables were identified on the basis of the strength of relationship between a series of demographic variables and the test scores. Low scoring groups on the variables strongly related to the test scores were identified as the target groups. They were described as follows: male respondents; respondents having a generally low level of education; respondents having occupations low in status; respondents having low level occupation types; respondents having spouses in menial or semi-skilled occupations; foreign born respondents(excluding Great Britain), especially those resident in Australia for less than six years; and respondents aged less than or equal to 24 years and respondents aged 40-59 years.

The health programs were designed largely with these groups in mind. Priority messages for the programs were selected on the basis of those items on which the target groups responded poorly.

Comparison of the test scores of members of the target groups between the experimental and control treatments showed that the effects of the health programs were not consistent across all of the groups (see section 3.3.5.2). Variations in the effects of media between socio-economic and demographic groups have often been found (Roberts & Maccoby, 1985; MacKuen & Coombs, 1981; McCleod et al., 1974; Cook et al., 1975).

In the present study the experimental group scored significantly higher than the control group overall and at test-time 1 for all target groups except males. Significant differences at test-time 2 were also found for respondents having spouses in low level occupation types and foreign born respondents (excluding Great Britain), especially those resident in Australia for less than six years.

Some large treatment effects were found for some target groups, especially at test-time 1. For example, the scores of foreign born respondents (excluding Great Britain), resident in Australia for less than six years, in the

experimental group was 10.75 scale points (i.e. 73.68%) higher than similar respondents in the control group at test-time 1 and 7.68 scale points (i.e. 48.98%) higher at test-time 2.

These findings support the view recently put forward by Roberts and Maccoby (1985) that media can have powerful effects under certain conditions. They are consistent with the findings of other studies which have demonstated that media can benefit people who have low socio-economic status and those who are poorly educated (Donohue et al., 1975; Maccoby et al., 1977; McLeod et al., 1979; Shingi & Mody, 1976; Tichenor et al., 1973). From a practical perspective the findings vindicate the general strategy used to develop the video programs. It is interesting to note the level of improvement in the test scores in foreign born respondents (excluding Great Britain), resident in Australia for less than six years, considering that all of the health programs were narrated in English.

3.4.3.3 Comparison of the treatment effects on target and non-target groups

Tichenor et al., (1970) assert that people from lower socio-economic status acquire information at a slower rate than those of higher socio-economic status. The present study afforded that opportunity to test this assertion by comparing the effects of the experimental treatment on the target (low scoring) and non-target (high scoring) groups. It was found that there was a substantial narrowing of the gap between the target and non-target groups as a result of exposure to the experimental treatment for the following target variables: education level, spouses occupation type, country of birth and length of residence (for foreign born subjects). The non-target group scored significantly higher than the target group for each of these target variables in the control condition. However, whilst the experimental treatment had no significant effect on the non-target group it significantly improved the test scores of the target group. Initial differences between the target and non-target groups were reduced by 26.76% for education; 30.71% for spouses occupation type; 56.84% for country of birth and 81.77% for length of

residence -- for foreign born respondents (excluding Great Britain), as a result of the experimental treatment. Whilst differences between target and non-target groups after exposure to the experimental treatment were still statistically significant (with the non-target group scoring higher) for education, spouses occupation type and country of birth, the difference was not significant for length of residence -- for foreign born respondents (excluding Great Britain).

These findings support Roberts and Maccoby's (1985) assertion that the "knowledge-gap" (Tichenor et al., 1970) effect is not unavoidable. They indicate that media can benefit the undereducated and reduce information gaps if the content is appropriately designed and transmitted. The fact that the "knowledge-gap" hypothesis implies that those who are originally deficient may be helped to catch-up may be seen by some critics as being open to threat from a regression artifact (Campbell & Stanlet, 1963). Low scorers may regress back to a mean position with repeated testing, due to measurement error. The effects of the present study, while showing that the target (low scoring) group do indeed "catch up" with high scorers, do not in general show an interaction with time; the change does not occur with time but across treatment groups. In the one case where time does interact with target condition (high vs. low) the effect is one opposite to that expected from a regression artifact. Therefore it seems likely that the effect of the treatment on knowledge is a genuine one.

The experimental treatment had a substantial effect on a number of the groups which were the primary focus of the study -- i.e. groups having little knowledge of child health practices. From a practical perspective the findings vindicate the targeting strategy used to develop the video programs which could well serve as a model for the development of health promotion media programs in hospitals and elsewhere.

CHAPTER 4

SUMMARY AND CONCLUSIONS

Based on practical and theoretical considerations this study set out to assess the impact of video-taped health programs in improving parent knowledge of child health practices in hospital waiting rooms. Following development of a test of parent knowledge of child health practices target groups of parents having poor knowledge were identified. Video taped health programs were identified and developed to be aimed primarily at these target groups. A field experiment of these programs was then implemented.

The overall effect of the media programs was found to be small, as has commonly been found elsewhere (Gatherer et al., 1979; Katz & Feldman, 1962; Patterson & McClure, 1976; Sears & Chaffee, 1979). Although there was a larger short term effect, retention of the health information was not strong overall.

Larger effects on certain population subgroups (i.e. a number of the target groups) were found, especially in the short term. These findings support the view recently put forward by Roberts and Maccoby (1985) that media can have powerful effects under certain conditions. They are consistent with the findings of other studies which demonstrate that media can benefit people who have low socio-economic status and those who are poorly educated (Donohue et al., 1975; Maccoby et al., 1977; McLeod et al., 1979; Shingi & Mody, 1976; Tichenor et al., 1973).

A comparison of the effects of the media programs on the target (low scoring) and non-target (high scoring) groups revealed a substantial narrowing of the knowledge gap between a number of these groups as a result of exposure to the programs. These findings support Roberts and Maccoby's (1985) assertion that the"knowledge-gap" (Tichenor et al., 1970) effect is not unavoidable. They indicate that media can reduce information gaps if the content is appropriately designed and transmitted (Donohue et al., 1975;

Maccoby et al., 1977; McLeod et al., 1979; Shingi & Mody, 1976; Tichenor et al., 1973).

From a practical perspective the findings vindicate the targeting strategy used to develop the video programs which could well serve as a model for the development of health promotion media programs in hospitals and elsewhere.

4.1 Further research

The present study has demonstrated that media can substantially improve knowledge in certain target groups when the contents are appropriately designed and transmitted. There is evidence that media can also have effects on behaviour (Farquhar et al., 1977; Maccoby et al., 1977; McAlister, 1976; Puska & Neittaanmaki, 1980; McAlister, 1981; Rogers, 1976; Farhar-Pilgrim & Shoemaker, 1981; Greenberg & Gantz, 1976; Wijgh, 1986; Mielka & Swinehart, 1976) although there are numerous reports of failed media campaigns (Udry et al., 1972; Robertson et al., 1974; Weiss, 1969). Small behavioural effects have often been reported (Gatherer et al., 1979), although Chaffee (1977) has suggested larger effects under certain conditions for specific population subgroups.

The behavioural effects of programs such as those developed in the present study, within the hospital waiting room setting, warrant investigation. No such studies have been reported in the literature. It is recommended that the research design and materials employed in this study be repeated and that behavioural effects on parents be measured through self reports by parents (via questionnaire) and in-home observation of the parenting behaviours which were the focus of the existing video programs. The impact of the changes in parenting behaviour on child health could be assessed via self reports by parents and medical examination of the children. Behavioural effects on target and non-target groups should be studied.

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APPENDICES

Appendix 1: List of literature consulted on child health and parenting curricula

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Appendix 2: The test development schedule

Content area	% of items
1. Accident prevention and first aid (28%)	
(a) Poisoning	9
(b) Burns and scalds (9%)	
- scalds (water/fat)	4
- clothing flammability	2
- first aid	2
- flammable liquids	1
(c) Road safety	5
(d) Drowning	2
(e) Other	3
2 Child development (20%)	
(a) Physical growth and development (6%)	
- sitting	1
- standing	1
- walking	1
- toilet training	1
- growth patterns	1
- role of sport	1
(b) Psychological development (10%)	
- learning/teaching	5
- mental retardation/mental ability	2
- attention seeking	1
- sleep	1
- other	1
(c) Behaviour problems (4%)	
- tantrums	1
- crying	2
- punishment/negative reinforcement	1
3. Nutrition (21%)	
(a) Role of vitamins, calcium, vegetables, fruit and breakfast in maintainance of a health diet	9
(b) Comparison of the nutritional value of canned versus fresh fruit and breastfeeding versus bottle feeding	2
(c) Food groups	5
(d) Overeating	3
(e) Other	2
4. Dental health (3%)	
(a) Plaque	1
(b) Periodicity of dental checkups	1
(c) Harmful foods	1
5. Immunisation (15%)	
(a) Diseases preventable by immunisation	5
(b) Number of treatments needed for immunisation	5
(c) Contageous diseases	3
(d) Other	2
6. Other (13%)	
(a) Hygiene (3%)	
- cleaning babies ears	2
- washing with soap	1
(b) Normal bowel function	4
(c) Normal renal function	1
(d) Sex/sexual problems	3
(e) Other	2

Appendix 3: Sources of test items and test catalogues consulted

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Appendix 4: Draft test (103 items)

OFFICE USE ONLY

UR [1 - 7] WR [8] ATT DATE [9 - 14] YEAR MTH DAY

RES. AD ..... L.G.A. [15 - 18] P/C [19 - 22]

PLEASE ANSWER ALL QUESTIONS

WORK QUICKLY

	OFFICE USE ONLY
1. Have you heard of Ipecac?	23
IF YES. What is it for?	24
2. Is it a good idea to light a barbecue with a flammable liquid?	25
3. Should babies' ears be cleaned?	26
IF YES. Is there any special way?	27
4. Have you heard of the Poison Information Centre?	28
IF YES. What is it for?	29
5. Is it possible to spoil a newly born child?	30
6. Do you think that washing babies with baby oil is just as good as washing them with soap and water?	31
7. What is plaque?	32

	OFFICE US ONLY
8. How often should children have a:	
(a) Dental check up	33
(b) Eye test	34
(c) General health examination between ages 10-15 years?	35
(d) Hearing test	36
9. Milk is a source of which mineral important for growing children?	37
10. If vitamins are not already in a child's diet which ones should be added?	38
11. In which direction on the stove should saucepan handles be facing in order to prevent a child from becoming scalded?	39
12. After what period of time would you call a doctor if your child had:	
(a) blood in urine	40
(b) blood in bowel movement	41
(c) a fever of 103°F/39°C	42

OFFICE USE ONLY

13. Which tap should be turned on first when running a bath for a child? ..... [ ] 43

14. How many hours sleep should children aged between 11 and 15 years have each night? ..... [ ] 44

15. At what age are young children likely to need extra vitamin C and D added to their diets? ..... [ ] 45

16. If a fever develops following a child's immunization injections what would you do? ..... [ ] 46

17. At what age is it safe for a child to ride a bicycle on the road? ..... [ ] 47

18. A child's daily diet should include food from four main groups. What are these groups.

1. ..... [ ] 48
2. ..... [ ] 49
3. ..... [ ] 50
4. ..... [ ] 51

19. What is the best room temperature for children? ..... [ ] 52

20. At what age should mothers be worried if their babies can't

(a) stand alone ..... [ ] 53

(b) be fully toilet trained during the day ..... [ ] 54

OFFICE USE ONLY

21. In the space below please write the diseases which can be prevented by vaccination, and indicate the number of injections that are needed for each of these. [ ] 55

..... [ ] 56
..... [ ] 57
..... [ ] 58
..... [ ] 59
..... [ ] 60
..... [ ] 61
..... [ ] 62
..... [ ] 63
..... [ ] 64
[ ] 65

22. At what age can children:

(a) walk alone ..... [ ] 66

(b) sit alone ..... [ ] 67

23. What would a well balanced breakfast for a child consist of? ..... [ ] 68
.....
.....
.....
.....

24. How often should children have a bowel movement? ..... [ ] 69

IN THE FOLLOWING QUESTIONS PLEASE CIRCLE THE CORRECT OR BEST ANSWER FROM THE ALTERNATIVES GIVEN.

25. In which age group do you think children are at greatest risk from accidents?

(a) 0 - 4 years

(b) 5 - 9 years [ ] 70

(c) 10 - 14 years

OFFICE USE ONLY

26. It is a good practice for children to eat two good sized servings of vegetables each day for which one of the following reasons.

(1) because they are clean and fresh

(2) because they contain essential starches and fats.

(3) because they help provide quick energy.

(4) because they provide minerals and aid regular bowel movements.

71

27. If a child is burned or scalded it is best to

(1) put antiseptic cream on it

(2) put the affected area in cold water

(3) wash it gently in borax solution.

(4) put butter on it

72

28. Which of the following nightwear would be most difficult to burn:

(1) a close fitting nightdress.

(2) close fitting pyjamas

(3) loose fitting pyjamas

(4) a nightie

73

OFFICE USE ONLY

29. A good daily diet includes some raw fruits and vegetables for which <u>one</u> of the following reasons.

(1) they are inexpensive and fill you up.

(2) they contain large amounts of protein

(3) they contain vitamins and minerals

(4) they are harder to digest when cooked.

7

30. If a child's clothing is in flames it is best to

(1) fetch a bucket of water

(2) rush the child to a tap or shower

(3) roll the child on the ground

7

31. Which of the following clothing materials is generally most difficult to burn.

(1) rayon

(2) pure cotton

(3) wool

(4) denim

7

32. When running a bath for a child it is best to

(1) run the cold tap first

(2) run both the hot and cold taps together

(3) run the hot tap first

7

33. How would you prevent a child from having tantrums when he doesn't get his own way.

(1) ignore him

(2) spank him

(3) give in

(4) hold and cuddle him

(5) offer him a new toy to distract him

7

OFFICE USE ONLY

IN THE FOLLOWING QUESTIONS PLEASE STATE WHETHER YOU THINK THEY ARE TRUE OR FALSE.

34. Allowing a two year old to run around the house without any clothes is likely to cause the child to have sexual problems later on. ..... ☐ 79

35. To prevent a scald to a child, saucepan handles should always be turned towards the front of the stove..... ☐ 8

36. Children should be more warmly dressed than adults..... ☐ 9

37. Drilling children on ABC's, numbers and colours increases their ability to learn more than just talking to them about interesting things going on around them..... ☐ 10

38. A baby who only cries a little does not need to be held as often as one who cries a lot. ..... ☐ 11

39. Children should be given laxettes if they don't have a bowel movements each day ..... ☐ 12

40. Chicken pox is not contagious..... ☐ 13

OFFICE USE ONLY

41. Parents can help their children's ability to learn without giving them specially designed toys and equipment. ..... ☐ 14

42. If your child has been taking a prescribed medicine and doesn't seem to be getting better the dose should be increased to get results. ..... ☐ 15

43. It is normal for young children to run high temperatures of 103° F or 104° F with illnesses that are not serious. ..... ☐ 16

44. A six week old baby who cries for a total of an hour or more each day almost always does so because he has problems that should be corrected. ..... ☐ 17

45. A fat baby is a healthy baby..... ☐ 18

46. Children's aspirin cannot cause poisoning..... ☐ 19

47. Measles is contagious. ..... ☐ 20

48. The window in a child's room should never be opened in winter. ..... ☐ 21

49. Children do not need breakfast provided they have a big lunch..... ☐ 22

OFFICE USE ONLY

50. If a child is mentally retarded there is almost nothing that a parent can do to help him/her learn. ☐ 23

51. Babies can be drown-proofed..... ☐ 24

52. Canned orange juice is a suitable substitute for fresh orange juice. ☐ 25

53. Breastfed babies are always healthier than bottle fed babies. ☐ 26

54. Providing children sit in the back seat of the car they do not need to wear seat belts. ☐ 27

55. Talking baby-talk to a nine month old child is harmful and should never be done..... ☐ 28

56. Providing young children follow the rule "look to the right, look to the left, look to the right again" they will be safe when crossing the road alone..... ☐ 29

57. Infants should be encouraged to play competitive sports..... ☐ 30

58. Giving children foods that require a lot of chewing is possibly harmful to their teeth and gums..... ☐ 31

OFFICE USE ONLY

59. Children should have a cooked breakfast whenever possible..... ☐ 3

60. An overdosage of aspirin is a common cause of poisoning in children. ☐ 3

61. Four year old children are not growing as fast as one year olds..... ☐ 3

62. Drowning can only occur in more than 6 inches of water..... ☐ 3

63. If a baby cries a lot it is almost always because of poor care by his parents..... ☐ 3

64. A child who enters into school activities with enthusiasm and vigor is generally more intelligent than a child who hangs back and is slow to participate..... ☐ 3

65. All children should have vitamin supplements. ☐ 3

66. One should always make a child vomit if he swallows poison..... ☐ 3

67. Children who are seldom spanked almost always grow up to be spoiled brats. ☐ 4

68. It is safe for a 5 year old to cross the road alone..... ☐ 4

OFFICE USE ONLY

69. Children who play sport should eat more than other children. ..... ☐ 42

70. Vegetables contain large amounts of protein..... ☐ 43

71. Growing children need snacks between meals. ..... ☐ 44

72. Polio immunization is not really necessary any more because the disease has been wiped out..... ☐ 45

73. If a child is bitten by a snake the poison must be sucked out immediately..... ☐ 46

74. Children who attend day care centres do not develop as well intellectually as children who stay home with their mothers..... ☐ 47

75. Most three year olds know that scary fairy tales are not true. ..... ☐ 48

76. It is not normal for two year old children to play with their sex organs..... ☐ 49

77. Green bowel movements are a sign of ill health in babies. ..... ☐ 50

OFFICE USE ONLY

78. When a child is too young to be fastened into a child restraint in a car it is safest if the mother holds the child in her arms. ..... ☐ 51

79. A four year old boy needs psychological evaluation if he consistently dresses up like a girl, says he wants to be a girl and plays only with girls..... ☐ 52

53 54

PLEASE CIRCLE ALL OF THE HAZARDS IN THIS HOME WHICH COULD CAUSE AN ACCIDENT TO A CHILD.

Appendix 5: Interviewer briefing notes and quality control measures

Interviewer briefing notes

Purpose

The purpose of this study (which should be related to the respondents) is to assess the knowledge of child health practises held by people attending the waiting rooms at the Adelaide Children's Hospital. All information supplied by the respondent is strictly confidential and no information which can identify the individual will be stored.

Method

To assess the respondents knowledge the Child Health Knowledge Test was developed for admininistration either via telephone or by personal home interview. The questionnaire is divided into three sections:

Section 1

Will be filled in directly by hospital staff and contains basic background data and confidential information.

Section 2

Contains 36 knowledge questions which should be read out verbatim. The alternative answers appear below each question and should not be read out to the respondents (except in questions 7 and 9-12).

Place the code of the answer given by the respondent in the box provided adjacent to the question. However, if the respondent gives an answer other than those already precoded, write the answer verbatim in the space marked 'other'. If no answer is given to the question then do not fill in the box.

EXAMPLE: If the respondent stated to question 1 that Ipecac is used for inducing vomiting, put a 1 in the box as shown below:

1. What is Ipecac used for?
   1. To induce vomiting, for poisoning
   2. Other (specify)..... [1] 38

In question 8, if the respondent states any of the diseases listed in brackets eg. (diptheria), place a 1 in the first box next to the disease/s stated. Then ask the respondent how many treatments are needed to prevent each of the diseases stated and place the number in the second box next to each of these diseases.

At the beginning of the questions numbered 13-36 ask the respondent to "indicate whether the following statements are true or false". If the respondent believes that a statement is true then put a 1 in the box next to that statement. If the respondent believes that the statement is false then put a 2 in the box.

Section 3

Contains 16 questions which seek to determine the demographic profile of the respondents and their spouses. Ask each question of the respondent and then, if married or in a de-facto relationship, ask the same question of their spouse. Answers to the questions are pre-coded and appear on the attached sheet (see Appendix 8), which should be kept close at hand.

Note: Where twin boxes are given and the answer requires only a single digit, place the digit in the right side box. Thus, a 6 would appear as follows:

If the answer involves double digits do not place both digits in the same box. A 12 should appear as follows:

The final question asks the respondents whether they would be interested in recieving a copy of the correct answers. If 'yes' put a 1 in the box, if 'no' put a 2 in the box.

Quality control measures

In order to ensure the quality of the data collection, the following measures were implemented:

(a) distribution of briefing notes to interviewers,
(b) conduct of a briefing session with interviewers to discuss the study and conduct example interviews,
(c) conduct of random checks to ensure that respondents were in fact interviewed,
(d) conduct of random checks on data collected by comparing it with available hospital record data and
(e) manual editing of all forms prior to data processing.

Appendix 6: The Child Health Knowledge Test

OFFICE USE ONLY

RESEARCH NUMBER [ ] 1 - 3

UR [ ][ ][ ][ ][ ][ ][ ] 4 - 10 WR [ ] 11 ATT DATE [ ][ ][ ] 12 - 17 (YEAR MTH DAY) ATT TIME [ ][ ][ ][ ] 18-21 HEALTH STATUS [ ] 22

CHILD'S NAME ..... SURNAME ..... GIVEN NAMES

RES. AD. ..... L.G.A. [ ][ ][ ][ ] 23 - 26 PC [ ][ ][ ][ ] 27 - 30

.....

PHONE [ ][ ][ ][ ][ ][ ][ ] 31 - 37

OFFICE USE ONLY

1. What is Ipecac used for?
   1. To induce vomiting, Poisoning.
   2. Other (specify).
      .....
      .....

   (To induce vomiting) [ ] 38

2. Should babies' ears be cleaned? ..... [ ] 39

   IF YES. Is there any special way?
   1. Outer ear with flannel.
   2. Cotton bud.
   3. Inner ear.
   4. Other (specify).
      .....
      .....

   (Outer ear only with flannel) [ ] 40

3. Is it possible to spoil a newly born child?
   1. Yes
   2. No.
      .....

   [ ] 41

OFFICE USE ONLY

4. Milk is a source of which mineral important for growing children?
   1. Calcium
   2. Protein
   3. Iron
   4. Vitamins
   5. Other (specify)
      .....

   (Calcium) [ ] 42

5. Which tap should be turned on first when running a bath for a child?
   1. Hot tap
   2. Cold tap,or
   3. Both hot and cold taps together.
      .....
      .....

   (Cold tap) [ ] 43

OFFICE USE ONLY

6. If a fever develops following a child's immunisation injections what would you do?

1. Call a doctor
2. Monitor the child's temperature for 3 hours
3. Give the child Panadol and a sponge bath, or
4. Do nothing, because fever is a normal reaction to such injections

.....

.....

(Give the child Panadol and a sponge bath)

[ ] 44

7. At what age should mothers be worried if their babies can't

(a) stand alone

1. 12-18 months
2. <12 months
3. >18 months

.....

(12-18 months)

[ ] 45

(b) be fully toilet trained during the day.

1. $2\frac{1}{2}$ - $3\frac{1}{2}$ years
2. <$2\frac{1}{2}$ years
3. >$3\frac{1}{2}$ years

.....

($2\frac{1}{2}$ - $3\frac{1}{2}$ years)

[ ] 46

OFFICE USE ONLY

8. Which common childhood diseases can be prevented by immunisation and how many treatments are needed for each of these (including boosters)?

..... (Diptheria 6) [ ] 47 [ ]

..... (Tetanus 6) [ ] 48 [ ]

..... (Whooping Cough 3) [ ] 49 [ ]

..... (Poliomyelitis 4) [ ] 50 [ ]

..... (Measles 1) [ ] 51 [ ]

..... (German Measles 1) [ ] 52 [ ]

..... (Mumps 1) [ ] 53 [ ]

WHICH ALTERNATIVE IS THE CORRECT OR BEST ANSWER.

9. In which age group do you think children are at greatest risk from accidents?

(a) 0 - 4 years
(b) 5 - 9 years
(c) 10 - 14 years

(0 - 4 years)

[ ] 61

10. If a child is burned or scalded it is best to

(1) put antiseptic cream on it.
(2) put the affected area in cold water
(3) wash gently in borax solution
(4) put butter on it

(put the affected area in

[ ] 62

OFFICE USE ONLY

11. Which of the following nightwear would be the most difficult to catch alight.

(1) a close fitting nightdress

(2) close fitting pyjamas

(3) loose fitting pyjamas

(4) a nightie

(close fitting pyjamas) [ ] 63

12. Which of the following clothing materials is generally most difficult to burn.

(1) rayon

(2) pure cotton

(3) wool

(4) denim

(Wool) [ ] 64

IN THE FOLLOWING QUESTIONS PLEASE STATE WHETHER YOU THINK THEY ARE TRUE OR FALSE.

1 = True
2 = False

13. Children should be more warmly dressed than adults .....

(False) [ ] 65

14. Drilling children on ABC's numbers and colours increases their ability to learn more than just talking to them about interesting things going on around them .....

(False) [ ] 66

OFFICE USE ONLY

15. A baby who only cries a little does not need to be held as often as one who cries a lot. .....

(False) [ ] 67

16. Children should be given laxettes if they don't have a bowel movement each day. .....

(False) [ ] 68

17. A six week old baby who cries for a total of an hour or more each day almost always does so because he has problems that should be corrected. .....

(False) [ ] 69

18. A fat baby is a healthy baby. .....

(False) [ ] 70

19. Children's aspirin cannot cause poisoning. .....

(False) [ ] 71

20. Babies can be drown-proofed. .....

(False) [ ] 72

21. Breastfed babies are always healthier than bottle fed babies. .....

(False) [ ] 73

OFFICE USE ONLY

22. Talking baby-talk to a nine month old child is harmful and should never be done. ..... (False) [ ] 74

23. Providing young children follow the rule "look to the right, look to the left, look to the right again" they will be safe when crossing the road alone. ..... (False) [ ] 75

24. Infants should be encouraged to play competitive sports. ..... (False) [ ] 76

25. Four year old children are not growing as fast as one year olds. ..... (True) [ ] 77

26. Drowning can only occur in more than 6 inches of water. ..... (False) [ ] 78

27. A child who enters into school activities with enthusiasm and vigor is generally more intelligent than a child who hangsback and is slow to participate. (False) [ ] 79

[ ] 80

OFFICE USE ONLY

28. All children should have vitamin supplements. ..... (False) [ ] 8

29. One should always make a child vomit if he swallows poison. ..... (False) [ ] 9

30. Children who are seldom spanked almost always grow up to be spoiled brats. ..... (False) [ ] 10

31. Children who play sport should eat more than others. ..... (False) [ ] 11

32. Vegetables contain large amounts of protein. ..... (False) [ ] 12

33. Growing children need snacks between meals. ..... (False) [ ] 1:

34. If a child is bitten by a snake the poison should be sucked out immediately. ..... (False) [ ] 1

OFFICE USE ONLY

35. It is not normal for two year old children to play with their sex organs. ..... (False) [ ] 15

36. Green bowel movements are a sign of ill health in babies. ..... (False) [ ] 16

OFFICE USE ONLY

		INTERVIEWEE	SPOUSE
37.	Sex	17 [ ]	31 [ ]
38.	Age group	18 [ ]	32 [ ]
39.	Country of birth	19 - 20 [ ][ ]	33 - 34 [ ][ ]
40.	If not Australia how many years lived here.	21 - 22 [ ][ ]	35 - 36 [ ][ ]
41.	Level of education achieved.	23 [ ][ ]	37 [ ][ ]
42.	Occupation classification.	24 - 25 [ ][ ]	38 - 39 [ ][ ]
	(a) Congalton's	26 - 27 [ ][ ]	40 - 41 [ ][ ]
	(b) Market		
43.	How many children do you have?	28 - 29 [ ][ ]	
44.	Marital status.	30 [ ][ ]	

45. WOULD YOU BE INTERESTED IN RECEIVING A COPY OF THE CORRECT ANSWERS TO THESE QUESTIONS. (1. Yes 2. No) 42 [ ]

OFFICE USE ONLY

46. Do you recall watching the television set in the Adelaide Children's Hospital when you attended recently?

1. Yes
2. No - END INTERVIEW

☐ 43

47. Do you recall seeing any programs on child health or health generally?

1. Yes
2. No - END INTERVIEW

☐ 44

48. Can you recall what the programs were about, i.e. what was their message?

Program 1:.....
.....
.....

☐☐ 45-46
☐☐ 47-48
☐☐ 49-50

Program 2.....
.....
.....

☐☐ 51-52
☐☐ 53-54
☐☐ 55-56

Others (Specify):.....
.....
.....

☐☐ 57-58
☐☐ 59-60
☐☐ 61-62

49. Did these programs cause you to change your behaviour in any way?

1. Yes
2. No - END INTERVIEW

☐ 63

50. In what ways?.....
.....
.....
.....
.....
.....

☐☐ 64-65
☐☐ 66-67
☐☐ 68-69
☐☐ 70-71
☐☐ 72-73
☐☐ 74-75

END INTERVIEW

Appendix 7: Demographic characteristics of subjects and their spouses [7]

Table A7.1: Age

Age group (in years)	Respondents		Spouses	
	no.	%	no.	%
<20	8	1.9	1	0.3
20 - 24	53	12.6	23	6.8
25 - 29	98	23.3	69	20.4
30 - 39	180	42.9	141	41.6
40 - 49	67	16.0	88	26.0
50 - 59	13	3.1	15	4.4
60+	1	0.2	2	0.6

Table A7.2: Sex

Sex	Respondents		Spouses	
	no.	%	no.	%
Male	43	10.2	302	89.3
Female	379	89.8	36	10.7

Table A7.3: Country of birth

Country	Respondents		Spouses	
	no.	%	no.	%
Australia	266	63.2	192	56.6
Great Britain	62	14.7	48	14.2
Greece	18	4.3	21	6.2
Italy	33	7.8	41	12.1
Other European	26	6.2	21	6.2
Asian and other	16	3.8	16	4.7

Table A7.4: Period of residence for foreign born respondents

Period (in years)	Respondents		Spouses	
	no.	%	no.	%
0 - 5	7	4.7	8	5.8
6 - 10	22	14.9	27	19.4
11 - 15	20	13.5	22	15.8
16 - 20	42	20.4	30	21.6
21 - 25	31	20.9	27	19.4
26 - 30	23	15.5	15	10.8
31+	3	2.0	10	7.2

[7] Spouse includes a partner in a defacto relationship

Table A7.5: Education level

Education level	Respondents		Spouses	
	no.	%	no.	%
Still at school	2	0.5	2	0.6
Never attended school or left school at 15 years or under	126	30.2	78	23.6
Left school over 15 years of age	197	47.2	159	48.0
Trade, technical or other qualification	73	17.5	67	20.2
Tertiary	18	4.3	23	6.9
Other	1	0.2	2	0.6

Table A7.6: Occupation category

Occupation category	Respondents		Spouses	
	no.	%	no.	%
Home duties	299	71.9	21	6.4
Retired	2	0.5	2	0.6
Unemployed	5	1.2	25	7.6
Students	5	1.2	5	1.5
Manual/domestic	27	6.5	52	15.8
Semi-skilled	12	2.9	55	16.7
Skilled	20	4.8	57	17.3
Clerical, sales, owner of small business	23	5.5	37	11.2
Middle management, middle professional, owner of medium sized business	19	4.6	57	17.3
Senior management, senior professional, owner of large business	4	1.0	19	5.8

Table A7.7: Occupation status level [8]

Occupation status level	Respondents		Spouses	
	no.	%	no.	%
1 (high)	2	0.6	8	2.7
2	2	0.6	31	10.3
3	19	5.4	28	9.3
4	17	4.9	33	11.0
5	26	7.4	60	20.0
6	193	55.3	91	30.3
7 (low)	90	25.8	49	16.3

Table A7.8: Number of children

Number of children	Respondents	
	no.	%
1	74	17.6
2	168	40.0
3	96	22.9
4	48	11.4
5+	34	8.1

Table A7.9: Marital status

Marital status	Respondents	
	no.	%
Never married	23	5.6
Married	316	76.3
Seperated	33	8.0
Divorced	27	6.5
Widowed	10	2.4
Defacto	5	1.2

8 Occupation status rankings were those developed by Congalton (1969)

Appendix 8: Code lists for the demographic section of The Child Health Knowledge Test

Question number	Subject	Codes
37	Sex	1 = Male 2 = Female
38	Age group (in years)	1 = Under 20 2 = 20 - 24 3 = 25 - 29 4 = 30 - 39 5 = 30 - 49 6 = 50 - 59 7 = 60+
39	Country of birth	See LIST A [9]
40	If not Australia, how many years lived here	Write in the number
41	Level of education	1 = Still at school 2 = Never attended school or left at 15 or younger 3 = Left school over 15 years of age 4 = Trade, technical or other qualification 5 = Tertiary qualification Other (specify .....)
42	Occupation	
	(a) Congaltons	See LIST B [10]
	(b) Market	1 = Home duties 2 = Retired 3 = Unemployed 4 = Students 5 = Manual & domestic labour 6 = Semi-skilled labour 7 = Clerical, sales and owners of small business 8 = Middle management, middle professional and owner of medium sized business 9 = Senior management, senior professional and owner of large business
43	How many children do you have	Write in number
44	Marital status	1 = never married 2 = Married 3 = Seperated 4 = Divorced 5 = Widowed 6 = Defacto

[9] The code list used by the Australian Bureau of Statistics for the 1976 Census was attached as LIST A.

[10] Congatlon's (1969) 7-point scale was attached as LIST B.

Appendix 9: Contact details for subjects interviewed by telephone and home visits

Table A9.1: Contact details for subjects interviewed by telephone and home visits

Contact method	Respondents	
	no.	%
Telephone		
First call	190	38.0
Second call	54	10.8
Third call	31	6.2
Fourth call	22	4.4
Fifth call	25	5.0
No contact	53	10.6
Home visit		
First visit	51	10.2
Second visit	22	4.4
Third visit	18	3.6
Letter sent	12	2.4
No contact	22	4.4
Total	500	100.0

Appendix 10: Crosstabulation tables comparing respondents and non respondents on 'waiting room number' and 'residential location'

Table A10.1: Comparison of respondents and non-respondents on 'waiting room number' and 'residential location'

Variable	Non-respondents		Respondents		χ^2 test results
	no.	%	no.	%	
Waiting room number					
1	45	68.2	265	63.4	$\chi^2 = 3.82$
2	6	9.1	24	5.7	df = 4
3	4	6.1	20	4.8	Significance = .43
4	7	10.6	57	13.6	
5	4	6.1	52	12.4	
Residential location					
Para subdivision	18	26.5	61	14.2	$\chi^2 = 8.38$
North East subdivision	15	22.1	97	22.6	df = 5
Western subdivision	14	20.6	130	30.2	Significance = .14
Eastern subdivision	15	22.1	91	21.2	
Southern subdivision	6	8.8	47	10.9	
Outer Adelaide division	0	0.0	4	0.9	

Appendix 11: Proportion of subjects in low and high scoring groups selecting correct answers to items

Table A11.1: Proportion of subjects in low and high scoring groups selecting correct answers to items

Item number	Proportion in low scoring group (n = 184)	Proportion in high scoring group (n = 238)
1	19.6	37.0
2	27.7	39.9
3	32.6	52.1
4	46.2	70.6
5	50.5	88.7
6	41.8	66.8
8	46.7	55.0
9	52.2	95.8
10	48.8	94.5
11	47.3	96.6
12	51.6	96.6
13	41.8	90.8
14	36.4	86.6
15	16.3	25.6
16	1.1	9.2
17	0.5	8.0
18	9.2	36.1
19	7.6	34.0
20	35.3	84.5
21	28.8	82.8
22	9.2	24.8
23	54.9	53.8
24	53.8	88.2
25	47.3	89.4
26	31.5	60.9
27	50.0	82.4
28	41.3	72.7
29	52.7	95.4
30	65.2	97.5
31	35.3	58.0
32	67.9	97.9
33	61.4	89.5
34	59.2	86.1
35	36.4	63.0
36	46.7	71.4
37	52.2	90.8
38	53.3	20.6
39	26.1	34.0
40	66.3	95.0
41	51.6	86.1
42	38.0	74.8
43	35.3	80.7
44	42.9	88.2
45	48.4	79.0
46	27.7	60.9
47	49.5	69.3
48	27.2	75.2
49	45.7	90.3
50	29.3	50.4

Appendix 12: Program development guidelines

Target group description

The target groups for which programs are in need of development have the following characteristics:

(a) male,
(b) low education level,
(c) low occupation status,
(d) low level occupation types,
(e) foreign born (excluding Great Britain), especially those resident in Australia for less than six years,
(f) aged less than or equal to 24 years or 40-59 years and
(g) had spouses in low level occupation types.

Priority messages

Programs are to be developed for the target group to cover the following priority messages:

Immunisation

(a) Polio, Mumps and Rubella are all diseases preventable by vaccination.
(b) The correct number of treatments required to prevent certain diseases are specified below:

Tetanus (6)
Diptheria (6)
Polio (4)
Whooping cough (3)
Mumps (1)
Measles (1)
Rubella (1).

Accidents

(a) Explain purpose of Ipecac and how to use it.
(b) Poison should not be sucked out if a child has been bitten by a snake.
(c) It is not always correct to make a child vomit if he/she swallows poison (eg. should not make a child vomit where caustic substances or kerosene have been swallowed).
(d) Wool is the most difficult material to burn.

Child development

(a) Four year olds are not growing as fast as one year olds.
(b) It is not possible to spoil a new born child.
(c) It is normal for a six week old baby to cry for a total of an hour or more each day and is not an indication of health problems that need to be corrected.
(d) Green bowel movements are not a sign of ill health in babies.

Nutrition

(a) Vegetables contain large amounts of vitamins, minerals and roughage but not large amounts of protein.
(b) Breastfed babies do no tend to be healthier than bottle fed babies.
(c) Children do not need vitamin supplements providing they are getting a normal balanced diet. Vitamins should not be used as a substitute for a well balanced diet.

Hygiene

(a) Clean only the outer ear with a flannel but do not use a cotton bud or clean the inner ear.

Communication strategies

The literature on communications psychology, as summarised in Chapter 1 of the present report, is to be consulted to determine relevant communication strategies for the development of video programs which effectively meet the information needs of the target groups.

Appendix 13: List of video program segments

Existing programs used

From birth to walking, Film Australia, Eaton Road, Lindfield, N.S.W.

Growing together, South Australian Film Corporation, 113 Tapley's Hill Road, Hendon, S.A.

It couldn't happen, South Australian Film Corporation, 113 Tapley's Hill Road, Hendon, S.A.

Nutrition - you are what you eat, Educational Media Australia, 7 Martin Street, South Melbourne, Victoria

Protection for life, The South Australian Health Commission, 52 Pirie Street, Adelaide, S.A.

Rubella, The South Australian Health Comission, 52 Pirie Street, Adelaide, S.A.

To my child the world, National Safety Council of Australia, 186 Port Road, Bowden, S.A.

New programs developed

A safe place, Adelaide Children's Hospital, King William Road, North Adelaide, S.A.

Burns, S.A.S Channel 10 (45 Park Terrace, Gilberton, S.A.) in association with the Adelaide Children's Hospital.

Immunisation, Adelaide Children's Hospital.

Childhood accidents dont just happen, Adelaide Children's Hospital.

Appendix 14: Sample size estimation

The following formulae were used to calculate the sample size requirements [11]:

$$A = \frac{(Z_\alpha + Z_\beta)^2 2\sigma^2}{\delta^2}$$

$$\Rightarrow \quad \text{Sample size}(N) = \frac{A\,(f + 3)}{(f + 1)}$$

The following values were incorporated into the above equations to determine the sample size requirement:

$Z_\alpha = 1.645$ (for $\alpha = .05$)

$Z_\beta = 1.645$ (for $\beta = .05$ => Power = .95)

σ = 8.806 (representing the standard deviation about the mean of 28.2 as reported in Report 1)

δ = 1.7 (representing a 6% increase on the mean score of 28.2 reported in Report 1, page 35)

$f = 2A-1$

=> N = 586

Relaxation of the power requirement from 0.95 to 0.6 yielded the following sample size requirement:

$Z_\alpha = 1.645$ (for $\alpha = .05$)

$Z_\beta = 0.250$ (for $\beta = .04$ => Power = .60)

σ = 8.806 (representing the standard deviation about the mean of 28.2 as reported in Report 1)

δ = 1.7 (representing a 6% increase on the mean score of 28.2 reported in Report 1, page 35)

$f = 2A-1$

=> N = 195

[11] See Snedecor and Cochran (1967, p. 111-114).

Appendix 15: Answer sheet for the Child Health Knowledge Test

THE ADELAIDE CHILDREN'S HOSPITAL INC.

NORTH ADELAIDE
SOUTH AUSTRALIA 5006
Telephone 267 4999
Telex: ACHOSP: 89178

Enquiries RAC:MH
Extension 604

THE ADELAIDE CHILDREN'S HOSPITAL HEALTH PROMOTION SURVEY

ANSWER SHEET

Dear Parent,

Thank-you for your participation in our survey. Your assistance will help us in developing parent education programmes.

As requested, a copy of the correct answers to our questions is attached for your interest.

Yours faithfully,

Dr. Richard A. Cockington
Director,
Ambulatory Paediatrics

Peter O'Connor
Information Services Division
South Australian Health Commission

ANSWER SHEET

Q1.	What is ipecac used for?	(A. To induce vomiting)
Q2.	Should babies ears be cleaned? Is there any special way?	(A. Yes) (A. Outer ear with flanne
Q3.	Is it possible to spoil a newly born child?	(A. No)
Q4.	Milk is a source of which mineral important for growing children?	(A. Calcium)
Q5.	Which tap should be turned on first when running a bath for a child?	(A. Cold tap)
Q6.	If a fever develops following a child's immunization injections what would you do?	(A. Give the child Panadc and a sponge bath)
Q7.	At what age should mothers be worried if their babies cannot: (a) stand alone (b) be fully toilet trained during the day	(A. 12 - 18 months) (A. 2-1/2 to 3-1/2 years)
Q8.	Diseases which can be prevented by immunisations, and the number of treatments needed (including boosters), include:	Diptheria 6 Tetanus 6 Whooping Cough 3 Poliomyelitis 4 Measles 1 German Measles 1 Mumps 1
Q9.	In which age group do you think children are at greatest risk from accident?	(A. 0-4 years)
Q10.	If a child is burned or scalded it is best to	put the affected area in cold water
Q11.	Which nightwear would be most difficult to catch alight?	(A. Close fitting pyjamas
Q12.	Which clothing material is generally the most difficult to burn?	(A. Wool)
Q13.	Children should be more warmly dressed than adults.	(A. False)
Q14.	Drilling children on ABC's, numbers and colours increases their ability to learn more than just talking to them about interesting things going on around them.	(A. False)
Q15.	A baby who cries a little does not need to be held as often as one who cries a lot.	(A. False)
Q16.	Children should be given laxettes if they don't have a bowel movement each day.	(A. False)
Q17.	A six week old baby who cries for a total of an hour or more each day almost always does so because he has problems that should be corrected.	(A. False)

Q18.	A fat baby is a healthy baby.	(A. False)
Q19.	Children's aspirin cannot cause poisoning.	(A. False)
Q20.	Babies can be drownproofed.	(A. False)
Q21.	Breastfed babies are always healthier than bottle fed babies.	(A. False)
Q22.	Talking baby-talk to a nine month old child is harmful and should never be done.	(A. False)
Q23.	Providing young children follow the rule "look to the right, look to the left, look to the right again", they will be safe when crossing the road alone.	(A. False)
Q24.	Infants should be encouraged to play competitive sports.	(A. False)
Q25.	Four year old children are not growing as fast as one year olds.	(A. True)
Q26.	Drowning can only occur in more than 6 inches of water.	(A. False)
Q27.	A child who enters into school activities with enthusiasm and vigor is generally more intelligent than a child who hangs back and is slow to participate.	(A. False)
Q28.	All children should have vitamin supplements.	(A. False)
Q29.	One should always make a child vomit if he swallows poison.	(A. False)
Q30.	Children who are seldom spanked almost always grow up to be spoilt brats.	(A. False)
Q31.	Children who play sport should eat more than others.	(A. False)
Q32.	Vegetables contain large amounts of protein.	(A. False)
Q33.	Growing children need snacks between meals.	(A. False)
Q34.	If a child is bitten by a snake the poison should be sucked out immediately.	(A. False)
Q35.	It is not normal for two year old children to play with their sex organs.	(A. False)
Q36.	Green bowel movements are a sign of ill health in babies.	(A. False)

Appendix 16: Contact details for respondents interviewed by telephone and by home visit

Table A16.1: Contact details for respondents interviewed by telephone and home visit

Contact method	no.	%
Telephone		
First call	669	42.0
Second call	204	12.8
Third call	84	5.3
Fourth call	69	4.3
Fifth call	11	0.7
No contact	66	4.1
Home visit		
First visit	242	15.2
Second visit	99	6.2
Third visit	65	4.1
Card left	53	3.3
No contact	31	2.0
Total	1593	100.0

Appendix 17: Crosstabulation tables comparing respondents and non-respondents on waiting room number and time of arrival

Table A17.1: Crosstabulation table comparing respondents and non respondents on waiting room number

Waiting room number	Response group			
	Non-response		Response	
	no.	%	no.	%
1	69	6.9	932	93.1
2	8	5.4	139	94.6
3	7	4.7	141	95.3
4	6	3.5	167	96.5
5	7	5.7	116	94.3

Table A17.2: Crosstabulation table comparing respondents and non respondents on time of arrival

Time of arrival	Response group			
	Non-response		Response	
	no.	%	no.	%
0am - 12am	38	5.7	623	94.3
12.01am - 4pm	39	6.5	561	93.5
4.01pm - 8pm	15	6.2	226	93.8
8.01pm - 12pm	5	5.6	85	94.4

Appendix 18: Crosstabulation tables comparing treatment groups on demographic characteristics

Table A18.1: Crosstabulation table comparing treatment groups on waiting room number

Waiting room number	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
1	352	61.0	113	59.2	352	65.1	115	61.8
2	55	9.5	19	9.9	47	8.7	18	9.7
3	56	9.7	20	10.5	47	8.7	18	9.7
4	66	11.4	22	11.5	58	10.7	21	11.3
5	48	8.3	17	8.9	37	6.8	14	7.5

Table A18.2: Crosstabulation table comparing treatment groups on time of arrival

Time of arrival	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
0am - 12am	233	40.4	77	40.3	219	40.4	94	50.8
12.01pm - 4pm	229	39.7	75	39.3	207	38.2	50	27.0
4.01pm - 8pm	90	15.6	29	15.2	79	14.6	28	15.1
8.01 - 12pm	25	4.3	10	5.2	37	6.8	13	7.0

Table A18.3: Crosstabulation table comparing treatment groups on residential location

Residential location	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Para subdivision	85	14.6	22	11.5	59	10.9	21	11.3
Nth.- east subdiv.	109	18.9	37	19.4	110	20.3	34	18.3
Western subdiv.	203	35.2	70	36.6	195	36.0	71	38.2
Eastern subdiv.	128	22.2	40	20.9	138	25.5	41	22.0
Southern subdiv.	44	7.6	19	9.9	38	7.0	18	9.7
Outer Adel. subdiv.	9	1.6	3	1.6	2	0.4	1	0.5

Table A18.4: Crosstabulation table comparing treatment groups on sex of respondent

Sex of respondent	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Male	36	6.2	18	9.4	46	8.5	15	8.1
Female	541	93.8	173	90.6	494	91.5	171	91.9

Table A18.5: Crosstabulation table comparing treatment groups on age of respondent

Age of respondent (years)	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
<20	11	1.9	4	2.1	14	2.6	4	2.2
20 - 24	73	12.7	27	14.1	70	12.9	24	13.0
25 - 29	153	26.6	53	27.7	166	30.6	50	27.0
30 - 39	235	40.8	80	41.9	216	39.9	82	44.3
40 - 49	80	13.9	18	9.4	62	11.4	19	10.3
>50	24	4.2	9	4.7	14	2.6	6	3.2

Table A18.6: Crosstabulation table comparing treatment groups on country of birth of respondent

Country of birth of respondent	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Australia	367	63.8	119	62.3	313	58.4	107	57.8
Great Britain	68	11.8	19	9.9	50	9.3	14	7.6
Greece	19	3.3	6	3.1	25	4.7	12	6.5
Italy	34	5.9	19	9.9	54	10.1	18	9.7
Other European	41	7.1	13	6.8	54	10.1	21	11.4
Asian & other	46	8.0	15	7.9	40	7.5	13	7.0

Table A18.7: Crosstabulation table comparing treatment groups on number of years in Australia (foreign born respondents)

Number of years in Australia (foreign born respondents)	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
0-5	40	19.3	19	26.0	41	18.5	14	18.7
6-10	30	14.5	4	5.5	16	7.2	12	16.0
11-15	26	12.6	8	11.0	24	10.8	7	9.3
16-20	35	16.9	15	20.5	54	24.3	24	32.0
21-25	32	15.5	13	17.8	49	22.1	12	16.0
26-30	27	13.0	11	15.1	26	11.7	4	5.3
>30	17	8.2	3	4.1	12	5.4	2	2.7

Table A18.8: Crosstabulation table comparing treatment groups on education level of respondent

Education level	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Still at school & other	5	0.9	1	0.5	3	0.6	2	1.1
Never attended or left 15 yrs. or less	186	32.2	66	34.6	204	37.8	67	36.0
Left > 15 yrs.	276	47.8	85	44.5	227	42.0	82	44.1
Trade, technical qualificn.	48	8.3	20	10.5	48	8.9	14	7.5
Tertiary	62	10.7	19	9.9	58	10.7	21	11.3

Table A18.9: Crosstabulation table comparing treatment groups on occupation status level of respondent [12]

Occupation status level of respondent	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
1 + 2	9	1.6	5	2.6	12	2.2	4	2.2
3	16	2.8	5	2.6	15	2.8	6	3.2
4	25	4.3	12	6.3	24	4.5	9	4.8
5	43	7.5	10	5.2	30	5.6	10	5.4
6	31	5.4	9	4.7	38	7.1	10	5.4
7	453	78.5	150	78.5	420	77.9	147	79.0

Table A18.10: Crosstabulation table comparing treatment groups on occupation type of respondent

Occupation type	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Home duties	388	67.2	132	69.1	382	71.0	130	69.9
Retired, student or unemployed	35	6.1	13	6.8	27	5.0	10	5.4
Manual or domestic labour	35	6.1	11	5.8	44	8.2	11	5.9
Semi-skilled labour	43	7.5	11	5.8	27	5.0	12	6.5
Clerical, sales or owner of small business	51	8.8	16	8.4	33	6.1	14	7.5
Middle managmt., professional or owner of medium sized business	24	4.2	7	3.7	19	3.5	8	4.3
Senior managmt., professional or owner of large business	1	0.2	1	0.5	6	1.1	1	0.5

[12] Occupation status level as defined by Congalton (1969).

Table A18.11: Crosstabulation table comparing treatment groups on respondent's number of children

Number of children	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
1	103	17.9	39	20.4	96	17.8	33	17.7
2	209	36.4	72	37.7	182	33.8	59	31.7
3	164	28.6	48	25.1	175	32.5	66	35.5
4	73	12.7	19	9.9	56	10.4	19	10.2
5 +	25	4.4	13	6.8	30	5.6	9	4.8

Table A18.12 Crosstabulation table comparing treatment groups on marital status of respondent

Marital status of respondent	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Never married	33	5.7	7	3.7	27	5.0	9	4.8
Married	411	71.2	149	78.0	402	74.4	141	75.8
Separated	60	10.4	12	6.3	64	11.9	14	7.5
Divorced	54	9.4	17	8.9	35	6.5	15	8.1
Widowed	7	1.2	3	1.6	6	1.1	3	1.6
Defacto	12	2.1	3	1.6	6	1.1	4	2.2

Table A18.13: Crosstabulation table comparing treatment groups on age of spouse

Age of spouse (in years)	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
<25	24	5.4	10	6.7	16	4.0	4	2.8
25 - 29	91	20.5	30	20.0	84	20.9	15	10.6
30 - 39	210	47.4	70	46.7	180	44.9	73	51.4
40 - 49	97	21.9	27	18.0	101	25.2	40	28.2
50 - 59	18	4.1	12	8.0	17	4.2	8	5.6
60 +	3	0.7	1	0.7	3	0.7	2	1.4

Table A18.14: Crosstabulation table comparing treatment groups on spouse's number of years in Australia (foreign born)

Spouses number of years in Australia (foreign born)	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
0 - 5	35	17.1	13	17.1	34	15.5	14	16.7
6 - 10	25	12.2	10	13.2	30	13.7	12	14.3
11 - 15	18	8.8	9	11.8	18	8.2	6	7.1
16 - 20	51	24.9	20	26.3	59	26.9	25	29.8
21 - 25	41	20.0	14	18.4	48	21.9	18	21.4
26 - 30	22	10.7	8	10.5	17	7.8	7	8.3
31 +	13	6.3	2	2.6	13	5.9	2	2.4

Table A18.15: Crosstabulation table comparing treatment groups on occupation status level of spouse [13]

Occupation status level of spouse	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
1	24	5.4	7	4.6	26	6.5	4	2.8
2	40	9.0	16	10.6	35	8.8	12	8.4
3	18	4.1	7	4.6	17	4.3	9	6.3
4	39	8.8	12	7.9	40	10.0	15	10.5
5	83	18.7	23	15.2	57	14.3	26	18.2
6	92	20.8	35	23.2	91	22.8	36	25.2
7	147	33.2	52	33.8	134	33.5	41	28.7

13 Occupation status level as defined by Congalton (1969).

Table A18.16: Crosstabulation table comparing treatment groups on occupation type of spouse

Occupation type	Group							
	Control				Experimental			
	Time1		Time2		Time1		Time2	
	no.	%	no.	%	no.	%	no.	%
Home duties	43	9.7	13	8.6	17	4.2	4	2.8
Retired or student	5	1.1	4	2.6	12	3.0	3	2.1
Unemployed	59	13.3	20	13.2	51	12.7	15	10.5
Manual or domestic labour	114	25.7	40	26.5	95	23.7	43	30.1
Semi-skilled labour	69	15.6	24	15.9	68	17.0	24	16.8
Clerical, sales or owner of small business	95	21.4	27	17.9	81	20.2	29	20.3
Middle managmt., professional or owner of medium sized business	43	9.7	21	13.9	52	13.0	19	13.3
Senior managmt., professional or owner of large business	15	3.4	2	1.3	25	6.2	6	4.2

Appendix 19: Matrix of correlation coefficients for dependent and independent variables

Variable number*	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	-.17									
3	.00	-.01								
4	-.07	.10	.08							
5	.07	.01	.18	.11						
6	.14	-.01	.23	.10	.70					
7	.07	.02	.16	.12	.36	.50				
8	.05	.03	.11	.03	.16	.35	.74			
9	.09	.02	.23	.13	.71	.62	.33	.17		
10	.06	-.03	.18	.07	.57	.56	.31	.23	.56	
11	.08	.10	.16	.11	.17	.36	.22	.17	.42	.14
12	.13	.05	.11	.03	.59	.73	.34	.23	.44	.41
13	.06	.05	-.02	.04	.66	.57	.25	.10	.48	.34
14	.03	.04	.30	.09	.35	.54	.40	.32	.52	.43
15	.07	-.01	.33	.08	.52	.66	.44	.36	.47	.47
16	-.01	.02	.21	.10	.33	.41	.61	.44	.29	.27
17	.04	-.00	.14	.00	.20	.30	.43	.49	.14	.13
18	.04	.02	.31	.13	.50	.45	.33	.22	.62	.43
19	.06	.06	.29	.05	.41	.41	.39	.27	.35	.38
20	.03	-.01	.33	.13	.52	.42	.27	.16	.52	.39
21	.11	-.01	.23	.11	.75	.64	.20	.11	.79	.65

	11	12	13	14	15	16	17	18	19	20
12	.24									
13	.21	.49								
14	.39	.39	.12							
15	.24	.48	.10	.78						
16	.16	.24	.07	.53	.62					
17	.13	.19	.03	.34	.46	.75				
18	.27	.30	.10	.72	.76	.49	.29			
19	.19	.30	.10	.64	.67	.50	.31	.56		
20	.25	.29	.10	.62	.72	.42	.25	.81	.59	
21	.34	.48	.47	.47	.51	.22	.10	.58	.37	.56

* Variable numbers refer to the following variables:

1. Waiting room number
2. Time of attendance
3. Health status
4. Residential location
5. Respondent's sex
6. Respondent's age group
7. Respondent's country of birth
8. Respondent's length of residence (for foreign born)
9. Respondent's education level
10. Respondent's occupation status
11. Respondent's occupation category
12. Respondent's number of children
13. Marital status
14. Spouse's sex
15. Spouse's age group
16. Spouse's country of birth
17. Spouse's length of residence (for foreign born)
18. Spouse's education level
19. Spouse's occupation status
20. Spouse's occupation category
21. Knowledge score

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ERRATA

P11	Line 8		child's
P12	Para 2	Line 5	person's
P22	Para 3	Line 1	source's
P24	Para 2	Line 12	humorous
P34	Para 2	Line 6	the majority of the sample (some percentages are less than 50%)
P51	Para 5	Line 1	was designed
P65	2nd last line		test-times
P66 & 67	Ditto		
P83	Para 2	Line 6	equivalence