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**INVOLVEMENT OF PRIMARY SCHOOL
CHILDREN IN THE
PRODUCT DEVELOPMENT PROCESS**

A Thesis presented
in partial fulfilment of
the requirements for the
Degree of Master of Technology in
Product Development at Massey University.

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1996

It is important to understand children.
Who they are, what they are, what their
abilities are and what they like and need.
It is important to understand children's situation
in a grown up world, dominated by grown up things and thoughts.
This is - in our opinion - the essence of researching children

Anonymous: Quote from Seminar on Researching Children
ESOMAR Aarhus, 18th-20th October, 1978 page iii

ABSTRACT

The purpose of this research was to study some ways in which children could contribute to the development of products for which they were the main consumers. The research was conducted with female primary school children in small groups selected because they were part of the target market. The project had two specific aims; the development of techniques for incorporating ethical standards into projects involving young children, and the evaluation of a series of techniques that would enable children to develop and screen concepts for new products.

This research was undertaken in a local New Zealand primary school using four class rooms of children aged between five and nine years. The first stage of the project involved ninety-one children, male and female in a Group Introduction where a questionnaire on toy products was completed as a class room activity.

The second stage of the project only involved the female children from these four classes and they participated in four stages of the Product Development Process. These were; **Product Idea Generation and Screening**, and Product Concept Development and Testing. In these sessions up to eight children, placed in groups according to age, tried the various techniques to develop a product concept for a new doll. The techniques used by the female children included; Focus Groups, Projective Techniques, Scaling and Preference Questionnaires, Card Sorting, Conjoint Analysis and Multidimensional Scaling. Of these Conjoint Analysis and Multidimensional Scaling were the least successful with the children.

The research showed that female New Zealand children over the age of six years can use the techniques tested to contribute usefully to the Product Development Process. This process was successful in the New Zealand school context because the children had a high standard of literacy and were comfortable with group and creative project work of this kind.

Techniques incorporated in the project to meet ethical standards were; a detailed reporting system to all participants of the project, no screening of the children but screening of the data after the test was completed, and a motivation method that rewarded attendance not performance and many chances for the children to withdraw from the project. The methods on the whole proved to be successful.

The issue of screening is important but the research showed it is not necessary or may not be desirable to conduct a detailed screening programme with children to find those with special skills, to obtain information for the Product Development Project.

The modifications to the techniques used with adults for consumer analysis with children should focus on methods of improving the communication between the researcher and the children.

This project shows general that in much the same way as the average adult consumer participates in the development of products, average children can make a valuable contribution to the development of new products in the first stage of the Product Development Process.

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Chapter 1

Introduction

1.1 Product Development Process

The Product Development Process is widely used in the food, beauty care and household products industries with adult consumers, but in other industries it has only been used in a haphazard fashion. In particular it has seldom been used in the development of products for children. The process of developing new products is a highly developed science. Product Development involves the combination of product design or formulation, marketing research and consumer research into one process. This multidisciplinary approach enables companies to produce products that meet not only their manufacturing and costing needs, but also the needs of their target markets.

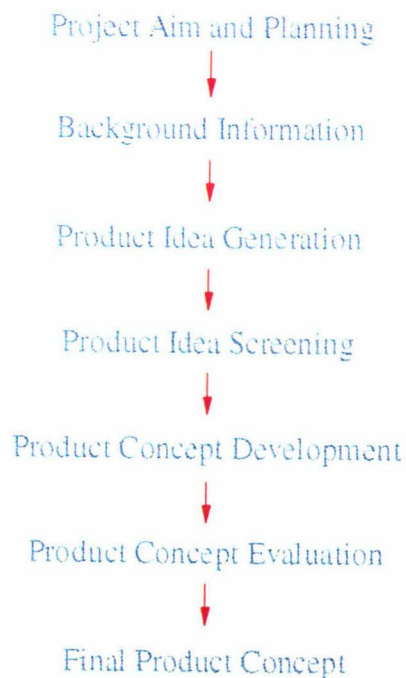


Figure 1.1: First Stage of the Product Development Process

The Product Development Process can be separated, arbitrarily, into three stages. The first stage of Product Development involves generation of new ideas and then screening and evaluating them until one feasible product concept is produced. The second stage takes the product concept to a completed prototype form and the third stage involves the market testing, production and final launching of the product into the correct market. The first stage of the Product Development Process was studied in this research, and the steps in the project are shown in Figure 1.1.

1.2 The Consumer in the Product Development Process.

Many new products fail in the market place each year. Twiss (1986) defines one of the factors for successful technical innovation as *market orientation*. Market oriented companies ensure that consumer information is included in the Product Development Process at as early a stage as possible. Product users are a good source of information for Product Development and some companies have routinely used adult consumers as an integral part of their Product Development Process. Researchers have therefore developed techniques to obtain information from consumers for use in the Product Development Process at different stages. Consumers are involved in generating and screening product ideas, developing and testing product concepts, testing prototype products during product design or formulation, testing the final product during consumer and market tests, and supplying market information during and after product launches.

At the present time, the majority of consumers participating in Product Development are women above the age of eighteen years, but some men are used for the "male" products. The need for generalisation in market research has meant that many sectors of the community, for example ethnic groups and children, have been largely ignored in terms of input into the Product Development Process. Children are a disenfranchised group that has very little

power in our society and, along with many other issues, children are largely being ignored in terms of input into the Product Development Process. School-aged teenagers are sometimes involved in research on products specifically designed for teenagers, but this does not allow for the fact that teenagers are also consumers of other products used by the general population. Opinions from teenagers on these products are usually only gained if an in-home consumer or market test is carried out and their opinions are included in the household survey. Younger children remain pretty much neglected in terms of input into the Product Development Process. While there are many companies in larger countries, such as Children's Market Research Inc. in New York and the Children's Research Unit, London and Sydney, that specialise in consumer research with children, children are not involved routinely by many of the companies that make products targeted specifically at children. Children are sometimes asked to test the final products and some work is being carried out by research companies specialised in obtaining consumer information from children in other areas of the Product Development Process, with a limited number of companies. However they are seldom included in the initial stages of the process, developing the product concept and the original product design as a matter of course.

1.3 The Reasons for Little Participation of Children in the Product Development Process

Why are children, who make up a reasonable part of the consumer market and with a known influence over purchasing decisions, largely ignored when it comes to input into the Product Development Process? Many companies would define the target market for their products as children, but only a relatively small amount of consumer work is carried out specifically with primary school aged children due to the recognised difficulties in obtaining reliable information from these consumers in New Zealand.

There are many reasons why research with children is difficult for adults. Children have minds, personalities and opinions of their own which are different to adults. In terms of the consumer age, children today have had different experiences than the present adults and they will continue to grow up in a world bombarded with new consumer goods and the associated advertising. They do not remember a world without television and superstores. Researchers cannot imagine what children are thinking as they did not experience the same world when they were children. This lack of common experiences creates a generation gap and gives rise to communication problems between the two groups. It is natural for adult researchers to use self-reference criteria to interpret results they collect from children and this problem is exaggerated when qualitative techniques are used. An adult can have difficulty speaking the same language as a child and failure to do this will produce research results that mean nothing. Children have a different vocabulary from adults, but there has been a tendency to try to teach them an adult's vocabulary rather than trying to understand and incorporate children's vocabulary in the research.

Children under the age of ten have not completed their cognitive development and this means that many of the techniques used with adults may not be suitable for children without some modification. For example, younger children have difficulty considering ideas in the abstract, they cannot handle large amounts of information at one time and they have writing and reading skills appropriate to their age. It has become a chicken and egg situation. There has been little need to carry out research to develop techniques because no one includes children in product research unless it is absolutely necessary, and no one includes children because the limited amount of research has meant that techniques have not been fully developed and therefore results are unreliable.

There has been a limited amount published in the area of research with children although most of the work is being carried out on a commercial basis for particular companies and is therefore not published. It is now well

recognised that research with children can give accurate results if appropriate techniques are developed for them. There appears to be no reason why they cannot complete many of the same tasks as adults in terms of input into the Product Development Process if appropriate techniques are developed to enable them to provide valid, reliable, information that adult researchers can interpret, understand and use. The few researchers in the area have no doubt found the benefits of including children in their research (Wells, 1965; Cocks and Adams, 1978; Coutrot and de la Beaumelle, 1978; Lebender, 1978; Schwentner, 1978; Elliot, 1979; Baum, 1980; Neelankavil et al., 1985; Fraley, 1987; Greenbaum, 1988; McDonald and Topper, 1988; Younkin, 1989; Driggs and Mihm, 1990; Jenkins and Harrison, 1990; Kroll, 1990; Schoenfeld, 1991; Schraidt, 1991; Guber and Berry, 1993).

1.4 Why Consider Child Consumers in the Product Development Process?

Why do consumer researchers need to worry about including children in the Product Development Process? In 1965, Wells identified that children exerted an influence on product consumption. As society has moved more into the consumer age this influence has become more pronounced. Millar (1990) states that children should always test products, as well as parents, because parents buy the products but the children are often the users and both groups need to be satisfied. Schleier (1985) found that while products can be tested with parents to gather information on the child's behalf, as children get older the parents' responses become less accurate due to the emergence of peer influence, own money and time away from parents to purchase products. McNeal (1987) also commented on the fact that children shop independently from parents. It is not only products specifically for children that Product Developers need to consider. Children also help with the family shopping and have an influence over the brand chosen.

As with adults you have children that are innovators. These are children to whom other children look for cues in social issues, fashion and sport. They can articulate opinions well because they are asked all the time what they think about things. Such children are cynical and sophisticated consumers and they should be related to on that level, not ignored (Schleier 1985).

1.5 Children in Consumer Research, Product Design and Product Testing

Children have been of interest to researchers in terms of providing consumer information since the mid 1960's. Wells (1965) did the first significant research in this area with his attempt to unravel the mysteries of communicating with children, both in the researcher understanding the child and the child understanding the researcher.

Children have contributed to the Product Development Process but usually only after the product has been prototyped. The reason given for this is the recognised difficulty children have in dealing with the abstract. Children are involved in product testing especially in food products and other goods made for their specific use. With products such as toys, the children became involved when the toy reached the "Toy Fair" stage, that is, it was already in its final form for retailers to order. Children were then asked to rate the acceptability of the toy so as to gauge the success of the toy, if finally launched. Children were also involved in various types of consumer panels, for example testing television programmes, especially children's educational programmes.

For much of this research, the children were selected for leadership within their peer groups. For product testing, the children were often one-to-one with a researcher. This need for screening and one-to-one research made it very expensive in terms of time, money and people skills for the average company to contemplate involving children in the development of their products.

In this present research, the children were not selected for ability to perform the tasks or any particular leadership attributes as described by Younkin (1989). The researcher was keen to show that a New Zealand company can gather interested children from a local school and have them become involved in the first stage of the Product Development Process for products that are of direct interest to children. It was thought that if the process of identifying these children was too difficult then the companies would not wish to include children in their consumer research. Adults are not screened for competence for consumer work on the rationale that it is the "Mr and Mrs Typical Consumer" who buys the product who must be involved in the consumer research. Input from anyone other than the target consumers would be a waste of time. The same principles were applied in this research.

In terms of general market research, children do participate fully in advertising testing and this is where the majority of the consumer research with children has been. It is sad that advertisers have determined that children can provide input into making better advertisements to sell products to children long before product developers have decided that children could contribute to the development of products which could better meet their needs. This can be confirmed by every parent that has bought a product when pressured by a child because of an advertisement on television to find that the product does not satisfy the child's needs as portrayed and developed by the advertiser and becomes a "five day wonder".

The purpose of this research was to study, at the first stage of the Product Development Process, how children could contribute to the development of product concepts for which they are the products' main users. The project focused more specifically on the examination of techniques for obtaining consumer information from primary school children not selected for ability but simply because they belonged to a market segment. The research was with children in small groups and not in the one-on-one situation with the interviewer, with the children in a school situation not in a research unit.

1.6 Ethics of Consumer Research with Small Children

When a project requires the participation of people, a researcher must consider ethics as a vital part of the project planning and execution. This is especially important when working with children as they are not in a strong position to assert their rights because the researcher is an adult. However the literature available on ethics when working with children was not very detailed and was open to interpretation. It is very easy for a researcher to use consumers, perhaps unintentionally, to accomplish a research objective. It must always be remembered that without the cooperation of the consumers involved there is no research and at no time should consumers be put in any danger physically or psychologically. Children are extremely susceptible to a sense of failure and therefore a lowering of self esteem. While this may happen as they journey through life it should not be accelerated by agreeing to participate in a research program that is not vital to their development. Researchers should always put the consumer's needs first even if it means a compromise in the research method or activities to be undertaken, or the addition of extra activities that provide safeguards and respect for the rights of the participants.

In this research, ethics were even more of an issue because the research was in school time. It would have been easy for the children to see the researcher as having the same authority as a teacher and therefore fall into a teacher/pupil role. This would have placed undue pressure on the children to participate in the project. As the project was not a compulsory part of their schooling, it would have been unfair. In this project considering the research from an ethical view point meant changes in procedures and the addition of extra activities to ensure the participants suffered no ill-effects. Of particular importance before the planning was completed, was consultation with experienced groups such as a recognised ethics committee and people who work with children such as teachers, so as to ensure that no ethical issues had been over looked. Constant communication during the project with caregivers, teachers and the children also allowed any issues to be quickly addressed as they arose.

1.7 Why use Toys for the Research?

In much the same way as with adults, there is no point conducting consumer research on a topic in which the respondent has no knowledge. One of the ways to increase the attention span of a child and therefore to produce better research, is to discuss a topic in which they have had a lot of experience. It is obvious that the more expertise they have on the topic the more they will have to say (Mayes, 1980; Greenbaum, 1988).

Research in the literature supports the fact that toys are important consumer products to a child. Law (1978) conducted a study of expenditure of children aged between five and fifteen years in the mid seventies in Great Britain. Children, spent about half their annual spending on food with the next biggest expenditure on toys and games; 22% for five to nine year olds. The other categories were each less than 11%. Robertson and Rossiter (1976) in their research on advertising effects found that when they asked children what they wanted for Christmas presents about fifty percent of the choices were in the game and toy category for children aged five to ten years.

Belk et al. (1984) used children's products such as clothing, toys and bicycles to examine recognition of consumption symbolism, based on the hypothesis that children were more likely to own such products, and the choice of these products was also more likely to be made or influenced by the child who would have stronger feelings about them. Consumption symbolism is where consumers can agree that consumers or non-consumers, of a particular product share similar characteristics and therefore can form a stereotype. This has been proved to be true for adult with product for adult and to some extent with children and adult products also. Belk et al. (1984) showed that children were more likely to have stronger consumption stereotypes about their own products than adult products. The stronger the opinion the more definite the results. Price (1978) used confectionary, soft drinks and toys in a study on children's television advertising. Riecken and Yavas (1989) looked at the effect of

advertising on children using cereals, over the counter drugs and toys as product examples.

Sutton-Smith (1986) in his book "Toys as Culture" highlighted the importance of toys to all members of society including children. He examined toys in four contexts; family, technology, education and the market place. In the family, toys are important in human relationships providing a way of bonding and consolation especially when given as gifts by parents to children. They are also used to educate and create ideas of progress and achievement. In the technology context, toys are actually children’s tools of development and as machines they increase their powers to understand and give them a chance at autonomy. Toys that are miniatures of the real things also provide validation of the child’s inner world. The educational side of toys is perhaps more obvious, they provide a way of learning and developing cognition, and they also provide stimulation, sense of achievement, success and mastery. Lastly in the market place, toys are seen as novelties that incite consumer interest and provide entertainment. Toys are identified with connotations of possessions, consumption, capitalism, mass production and television commercials.

Sutton-Smith (1986) identified the best selling toys for six to twelve year olds in 1982. The exact toys are not really relevant but the categories are outlined in Table 1.1

Table 1.1: Best Selling Toys for Six to Twelve Year Olds in 1982

Fashion dolls	Games
Action figures	Crafts
Mini die-cast cars	Model Kits
Other cars	Construction and building
Mini trucks	Electronic games
Puzzles	Video games software and hardware
Outdoor activities	

The main focus of the project was the investigation of consumer research techniques to obtain information from children but, a product had to be chosen for the study. In order for the evaluation of the techniques to have the highest chance of success, the choice of product was most important. The product had to be one that kept the children interested and one for which they had a lot of information to contribute. The product area of toys was chosen to fulfil this criteria.

1.8 Aims of the Research

The two aims of this study were to:

- * develop techniques for incorporating ethical standards into projects when working with young children.
- * test a series of techniques that would enable all children working in small groups to develop and screen product concepts for new products.

Chapter 2

Review Of Children's Participation In Consumer Research

2.1 Introduction

This chapter looks at many issues in the literature that were important to the planning of this project. As written material in the specific area of this research was hard to find, research in related areas was used to collect suitable material. Much of the development of techniques in this area is carried out by companies as commercial ventures and is therefore not published.

Information was collected on factors that make it difficult to obtain meaningful participation from children. Attention span, language, abstraction difficulties, memory, the research situation and the lack of ability to identify the effect of background factors are discussed.

The research environment is most important to the success of the consumer research when children are involved. Important questions need to be considered. Should caregivers be present? What age is a child able to participate? Are friendships within a group a good idea? Can motivation techniques be used? Should groups contain both genders? How can suitable children be recruited?

A variety of consumer research techniques were examined that may be useful, with adaption, for use with children. In particular, group work, questionnaires and types of scales, are examined in some detail.

Lastly ethical issues have become important when working with all human respondents, but more so with children. Researchers can be seen as authority

figures and therefore take advantage of that position even if they do not intend harm.

2.2 Screening Children for Participation in Product Development

Screening of children for participation needs an understanding of child development in order to be effective and this area is briefly examined along with various screening techniques used by other researchers.

2.2.1 Child Development

The stage of development a child has reached is a factor in assessing the likely successful contribution a child could make to the development of a new product. This factor adds a new dimension to the screening process to select respondents. It is obvious that a certain level of mental, physical, social and emotional development is required before the child can perform many of the consumer research techniques presently used with adults. From a screening point of view the researcher must understand what can be expected of a child of a certain age with regard to the tasks being asked. Not only should they be in the likely target market or current product users but they also must have the skills to perform the tasks required during the research process. It is poor research design to decide to involve four year old children and then expect them to be able to read and write. While the exceptional four year old may be able to comply, the average four year old has not reached this stage. It is important therefore to work within the constraints of a child's ability. While not all children will develop at the same rate, general guidelines can indicate to a researcher what is possible with an average child of a certain age.

There are many theories of human development and it is not the purpose of this research to debate their various merits. Cognitive development of a child is one of the most important developmental factors for consumer research. When looking at other consumer research literature, the theories of Piaget

seem to be the most popular, although not universally so. In Berger (1983) and Gordon and Langmaid (1988), Piaget theories on cognitive development were discussed as four stages.

The *Sensori-motor* stage is from birth to two years. The infant uses senses and motor abilities to understand the world and are not able to contribute much to consumer research.

The second stage is *Pre-operational* and covers two to six or seven year olds. This child can now use symbolic thinking, including language, to understand the world. They are egocentric becoming less so towards the end of this stage as they start to understand that there are other points of view. Imagination in these children flourishes. These children will find it hard to interact as a group but will be able to do parallel activities together as a group. Their thinking is intuitive and animistic, for example, water runs down hill because it wants to, not because of gravity. Do not ask this age group projective questions such as; What would your sister buy you for a birthday present? Ask them directly what they would like. Six and seven year olds are successful in stating why they prefer something but for younger children the researcher should get them to draw the product and discuss it with them to find the various attributes. While they may use some form of child-speak it should not be used for the research as the language is by no means universal and they may not understand a word you are saying.

Concrete Operational is the name of the third stage and covers children from seven to eleven years. In this stage the child can understand and apply logical operations or principles when trying to interpret new experiences. A child will start to understand basic ideas of conservation, a set amount of water is the same no matter what size container it is put in, numbers and classification of items into groups. Children are capable of doing conceptual tasks however they cannot work in the abstract or deal with the hypothetical. They should be shown products if you expect them to choose between them.

The final stage is that of *Formal Operational* which starts at about twelve years. Children can think in the abstract and about hypothetical concepts and realise that there is more than one answer to questions. These children can also form test hypotheses. Interest in topics such as ethics and politics develop. Some people never fully reach this stage of thinking.

Cognitive skills are not the only skills that need to be developed for children to be able to successfully contribute to a consumer research programme. Some aspects of physical development, in particular, the fine motor skills necessary to hold a pencil and write or draw with some control, are not sufficiently developed until six years old, sometimes later. A child's brain and eyes also need to mature sufficiently to be able to master reading which does not happen until five years old (Berger, 1983).

A certain level of emotional development is also required if the child is going to participate in consumer research. For example, if a child is going to participate in a focus group without their caregiver being present, they must be able to be separated from their caregiver in a strange place without becoming distressed and thinking they have been abandoned or a lot of crying, instead of discussion will be the result (Berger, 1983; Gordon and Langmaid, 1988).

Lastly social skills need to be developed enough for the children to work in a group situation, if this is required. Berger (1983) states: "As they move from being egocentric preschoolers, school-age children develop their own subculture with its own language, values and codes of behaviour. They form a strong social dependence on their peers and feel a strong sense of rejection if they are left out." This improves their ability to work as a group instead of a set of individuals in the same place. The negative aspect of this is that peer pressure becomes more of a problem.

The effect of gender differences on child development is an area with a lot of disagreement. Berger (1983) states that while male and females at primary school have the same mathematical ability and motor skills, female children tend to be more verbal, possibly due to a more mature language centre in the brain.

2.2.2 Selection Procedures

Procedures for the selection of children discussed in the literature vary from project to project. The most involved is that described in a 1989 paper where Younkin selected to obtain children of above average ability for consumer panel work. While other people may perform less rigorous selection procedures, screening questionnaires are important in obtaining the right children to participate in a project. Screening for developmental age (it may be different from actual age) is vital for groups, so that children can interact in an equal footing and not become disruptive. Developmental age assessment should take account of mental, physical, emotional and social growth. Do they have the social skills, the ability to express themselves and the reading skills appropriate to their age group? They must also be screened in much the same way as adults to see if they are qualified to participate in the project, demographic and product use data are necessary for that. They can also be tested for specific skills related to the product and/or the activities they will need to complete the project (Barnewolt and Thrane 1989; Marney, 1991).

It has been identified that children with out-of-school activities are likely to perform better in a consumer research situation (Barnewolt and Thrane, 1989) and these children can be found during the screening process. Other information that is useful can also be collected at this time. For example, daily habits to determine the best time to conduct the research. The research time allocated should not clash with other activities, such as, swimming lessons or dinner time. Identification, is important, of special events in which the child is also involved and that may be more appealing than the research.

A school show or camp may get in the way of complete concentration on the research. By interviewing the children appropriate language can be obtained that can be used later in the actual research. (Barnewolt and Thrane, 1989)

Younkin (1989) worked with a panel of children aged 8 to 18. This panel was used in a variety of ways for idea generation, concept development and bench-top product direction. The focus in this paper was the selection procedure for obtaining the right children to participate in this process. Younkin (1989) believed that in the initial stages of Product Development it is difficult to capture the attention and stimulate the imagination of average children as the product concepts being tested are not well developed. "Average children" can easily become bored, distracted, impatient and disruptive. Therefore these children are not the best choice for the first stages of the Product Development Process. Due to the reduced levels of concentration, sessions cannot progress beyond 90 minutes. Average children take a lot of the moderator's time in just keeping them focused on the task at hand. Traditional methods of recruitment for each individual project take a long time to go through and often do not identify the correct children. By setting up a panel of suitable children this problem can be overcome therefore encouraging a company to involve children in the Product Development Process.

The screening process involved identification of peer group leader children in each age group. Younkin (1989) identified these children as those that peers congregate around formally and informally. These children tended to exhibit the following characteristics; warm, bright, outgoing and confident, comfortable in expressing themselves and opinions, ability to get along with friends well, and able to make new contacts easily and comfortably. They know about all the new trends and fashions but are not necessarily trendsetters.

The process to identify these children involved several steps. A presentation of the desired characteristics was made to youth leaders in recognised groups, such as teachers, guides, scouts and churches. They were then contacted and asked to help select children based on the criteria they had been shown. Recommended children were then interviewed by telephone for evidence of peer leadership characteristics by a series of questions. The children then completed a short questionnaire to confirm the findings of the telephone interview and to collect demographic data and product usage data. Lastly the children were tested in a group situation with other children of the same age and gender. They were exposed to typical techniques and observed for sociability, articulateness, willingness to express an opinion and ability to be creative. Those selected were on the panel for two years and were contacted no more than once a month.

Bahn (1986) only screened for cognitive development and used three tests to assess the children. The first was an open ended question about the origin of "night" for which the children were given a score for their answer. They were then asked to put ten sticks into order based on length. Finally he tested whether they had grasped the concept of conservation of length using two sticks of equal length in different positions. These three tests enabled children to be given a cognitive age.

2.3 The Individual Child in Consumer Research

"Communicating with Children" written by Wells in 1965 appeared to be the first significant piece of work in the area of working with children in consumer research. Previously the work was limited to psychological studies rather than an emphasis on involving children in marketing research. Wells (1965) looked at the communication problems between children and advertisers. Firstly he looked at how children had trouble explaining to advertisers what they meant and secondly how advertisers had difficulty

explaining their message to children. In doing this he identified that children were more difficult to interview than adults, which is no surprise to anyone, because of their limited ability to handle abstractions, limited memory and reduced vocabulary. He identified that the rapport between respondent and researcher is more important to obtain good results from children than with adults.

2.3.1 *Attention Span*

A child's limited attention span can be a problem for product developers, who inevitably have time constraints. It is largely dictated by the developmental age of the child being interviewed; the younger the child the shorter the attention span is likely to be. Mayes (1980) identified other important factors that can affect the length of time a child will concentrate on one activity which are given in Table 2.1.

Table 2.1: Factors Affecting the Attention Span of Children Involved in Consumer Research

High interest in the topic. Where the child has a high interest in the product there will be more to discuss and an increased vocabulary on the topic.

A specialised child interviewer. Will have the personality and techniques to keep children interested.

Logical interview structure. Logical from the child's point of view.

Stimuli material. A good idea to keep the child's attention focused.

Interview location. The interview location should have no distractions. Familiar surroundings like a home is good, but not their own as they tend to give answers that "mum" would like.

Length of questions and answers. Both should be as short as possible.

Distraction from the subject matter. Any research activities should not distract the child from the subject matter. For example, a long explanation on how to use a particular scale or activity.

Recording the data. Data should be able to be recorded without interrupting the flow of the interview or the child may easily forget the flow of the conversation.

2.3.2 *Language*

The researcher and respondent must share the same understanding of what the questions and answers mean. In order for this to happen the vocabulary may need to be adjusted (Mayes 1980). Wells (1965) observed the fact that the children had a limited vocabulary in terms of adult words but he did not determine that the children may have had their own vocabulary. Since then other researchers, such as Elliot (1979) and Kroll (1990) have understood that this is a two way problem. Adults do not understand the language of children and children have not yet learnt all the vocabulary of adults. Kroll's (1990) research on scales showed that with a little care, words can be chosen that both the child and the researcher clearly understand and can use to obtain accurate results. Language develops quickly in children and the developmental age of the child should always be taken into account when considering choice of language. Children do not like to be talked down to, and cannot be expected to come up to the level of the researcher (Fraleigh, 1987).

2.3.3 *Accuracy, Relevance, Validity and Honesty*

There is no point asking questions unless they stand some chance of providing accurate and useful results. Price questions and purchase frequency questions, for example, are questions that children cannot answer accurately and these types of questions should not be asked. It is important therefore to only ask questions that are relevant to the child and the questions should always be in their terms of reference (Mayes, 1980).

The pressure children feel that they must give an answer to the question, even if they do not have one, is more marked than in adults who, to some extent, feel the same in an interview situation (Mayes 1980). What may seem an absurd question to an adult may not to a child and they will answer it in all seriousness. For example which is bigger water or milk? The answer is milk because it has colour (Elliot, 1979).

In terms of gauging validity of results, a child's answer cannot be expected to be the same as an adult's answers, if they were there would be no point in interviewing children. In order to determine if the answers are valid therefore they should not be judged from an adult point of view. The researcher should see the significance in the answers from the child's point of view. "Does it make sense in the child's context and is it consistent, if it does then it is valid" (Gordon and Langmaid, 1988).

While children are more honest than adults, that is they are less likely to say what the interviewer wants to hear, they are not so naive that they cannot work out what is going on. If a lady from a sweet company asks what sweets they like and they think she may have a certain brand in her pocket they are likely to respond accordingly. Therefore the interviewer must be careful to remove sources of respondent bias (Elliot, 1979; Mayes, 1980).

2.3.4 *Use of the Abstract and Memory*

Children do not grasp the idea of the abstract until they are almost teenagers. This can pose a problem for some consumer research areas, for example, in concept testing, where the product has not actually been made. Care needs to be taken to provide appropriate stimuli to enable the children to understand what is being discussed (Wells, 1965).

The memories of small children can be very short. When asked to give a list of items such as favourite foods, the list will be incomplete and if prompted many more can be named. Often this list will include the most recent things eaten, even though they may have other favourites. Prompting can cause its own problems as children respond well to suggestion. Lastly children can have empty memory, that means, although they can recite a slogan or sing a jingle, they do not know what it means (Wells, 1965).

2.3.5 *Ages, Gender and Friendships of the Children*

Between what ages do you define "a child" for the purposes of consumer research? As expected this is linked to the development of children. They must have reached a certain stage of development before they can be expected to handle the tasks required. Schleier (1985) with reference to focus groups stated that only children from the age of six years have developed appropriate social skills to participate in a focus group. By the age of eight years, Schleier (1985) believed they should also be segregated by gender and should contain children no further than two years apart in age if the group is to run successfully. Schwentner (1978) used children over the age of eight years believing that under eight years old they could not handle rating scales and should do ranking and that over twelve years old they can handle adult scales with no modification. The ages of the children used by other researchers varies but most involve groups of children between the ages of six and twelve (Wells, 1965; Coutrot and de la Beaumelle, 1978; Elliot, 1979; Baum, 1980; Grabner, 1980; Mayes, 1980; Greenbaum, 1988; McDonald and Topper, 1988; Riecken and Yavas, 1989; Kroll 1990). Rodnight and Williams (1984), Lebender (1978) and Law (1978) involved children up to thirteen, fourteen and fifteen years respectively. Greenbaum (1988) while supporting the idea that children are between the ages of six and twelve felt that some young adults as old as fourteen or fifteen may require the special techniques in some circumstances. Neelankavil et al. (1985) focused on five and six year olds with their new technique that was developed especially for use with younger children.

In summary children under the age of six are generally not developed enough to be able to relate and articulate their feelings in a clear consistent way even using modified adult consumer research techniques. Whereas twelve year olds should not need the adult techniques altered to accommodate them. Younger children, under the age of six, can be involved in consumer research by using play and observation type techniques and also using specially

developed techniques for a particular purpose, such as developed by Neelankavil et al. (1985).

When considering gender issues in groups, Grabner (1980) had no problems with mixed groups in his advertising testing where the children drew pictures. Younkin (1989) always used children of the same gender in her panel groups as did Elliot (1979) and Greenbaum (1988) in their focus groups. The general consensus is that the single sex groups or pairs work better no matter what the age. Greenbaum (1988) commented that under a certain age males and females do not like each other, above that age they do like each other. Either situation can cause problems in a group situation. Different interests in terms of products can make it difficult, if the groups are of both genders, to reach a consensus.

A product which would keep the interest of the children when testing out a particular technique is important (Greenbaum 1988). Also to get reliable results from product testing it must be a product the child is interested in. This is illustrated by Robertson and Rossiter (1976). Male children, only, aged five to ten years were chosen to study the effects of advertising on choice of Christmas presents to facilitate simple classification of the types of items requested. Including both genders would have markedly increased the toy choices. Riecken and Yavas (1989) had children of both genders in their study and commented that when choosing the toys for their test they had to appeal to both sexes which restricted the choice.

Friendship pairs or groups mean initial comfort but can cause problems later as the friendships tend to dominate over honest answers with both children giving the same answer. Friendships can also cause problems with the cohesiveness of the group. Overall non-acquainted groups give a better session. It is a good idea to recruit friends when they will be required to work in pairs on an activity or game so that time is not wasted on getting to know each other (Schleier, 1985; Fraley, 1987; Jenkins and Harrison, 1990).

2.3.6 Recruitment of Children

Recruitment of children from schools is extremely common in research studies. Robertson and Rossiter (1976), Rodnight and Williams (1984), Roedder and Whitney (1986) and Riecken and Yavas (1989) all recruited children from schools for their research. Gorn and Florsheim (1985) used the Girl Guide organisation to recruit ten year olds girls for a study on the effect of adult product commercials on children. Younkin (1989) used schools and various youth organisations to recruit children for her panel work.

2.4 The Research Environment

2.4.1 Research Situation and Researcher Rapport

The standard research situation is foreign to a child. They do not normally sit around and have conversation on topics with adults they do not know. The presence of an unfamiliar child or adult, or the lack of other children if they are alone can cause an unsettled feeling in the child. Children are constantly taught to be careful of strangers. The research environment can also be seen as a strange place not like any other they have been in. As well the activity they are asked to do is strange and they do not understand what is expected of them. A researcher is lucky to get any response under these circumstances (Gordon and Langmaid, 1988).

Anyone who has looked after other people's children knows that children are inclined to say nothing when frightened, bored or shy. It is therefore important to put them at ease. Nothing is more likely to make a children remain quiet, than having someone waiting patiently for an answer. Techniques should be used to ensure the child is comfortable. The time taken to develop a good relationship with the child is time well spent. If a rapport is not achieved then the session should be abandoned (Wells, 1965).

2.4.2 *Warm-up Techniques*

Much of the literature refers to making the children feel comfortable in their environment in the first few minutes. It is most important to develop a rapport between the researcher and the child and between the children in the groups. Gordon and Langmaid (1988) advocated the playing of simple games to help the children settle down. For example, playing "Hangman" to find out the name of their partner, Chinese Whispers encourages them to listen to each other. A practice at the activity they will have to do, such as, drawing their home or family can also be a good idea. This makes them feel comfortable, drawing something they know well, and can provide information about them to the researcher.

McDonald and Topper (1988) used an "imitate the moderator" game and Musical Chairs as the first stage of their warm-up to their focus groups with children. Roedder and Whitney (1986) had a general discussion leading to more relevant discussion as a warm-up to their individual interviews as did McDonald and Topper (1988) for the final stage of their warm-up. Guber and Berry in their 1993 book started the warm-up for their focus groups with children by the moderator telling the children a little about themselves and the project. They then moved on to a topic of general interest, like a special holiday and slowly moved to more relevant topics until they reached the specific topics for the project. For younger children (five and six years old) the warm-up is some sort of physical activity or game so that they get rid of some of their physical energy and excitement and can settle down and participate in the group.

2.4.3 *Motivation and Excitement*

Keeping children interested over the time period of the project is a difficult task. Baum (1980) used a successful technique to keep children interested in a longitudinal diary study. While this study is not directly relevant to the present research, some of his techniques for keeping children motivated to keep filling out the forms are worth noting. To keep the children interested

he formed a club which had a certificate, monthly news and a mascot. Each month the children got a present, all completed diaries went into a lottery, there was contests to enter and a club mascot. New activities were added from time to time to keep the children interested. All this was dependent on the child sending in a diary each month. Sixty three percent of those asked to join were still in the club after three months with a join up rate of seventy four percent of those asked. This means that there was an actual drop out rate of eleven percent. This research focused on the need to achieve motivation through reward.

A new product that the child has not seen is likely to be exciting. This can cause problems as they can overstate their liking for the product. Observation over the time of the test can be used to get a better picture of their real feelings especially if the new product is presented along with another popular product in the same product category (Cocks and Adams, 1978).

2.4.4 *Background Factors*

It has been identified that there are many unknown factors that play a major role in the answers a child will give in a consumer research situation. The world of the child is constantly changing and therefore any data collected can only be seen as a snap shot in time. Factors that can affect the answers are in Table 2.2.

Table 2.2: Background Factors that Affect the Performance of Children in Consumer Research

Present interests.
Influence of friends and other peer groups.
Presence or absence and relative ages of brothers and sisters.
Toys they already have.

The factors are not easy to interpret in terms of the influence they exert. For example, if they are playing, at the present time, with the type of toys being tested they tend to rate the toy more positively than if they are not. Whereas adults can be expected to articulate these background factors, one cannot reasonably expect this from children especially the younger ones (Lebender, 1978; Neelankavil et al., 1985).

The feelings are mixed on whether parents/caregivers should be present during the interviews or activities. Gordon and Langmaid (1988) stated it is important to have a parent present if the child is under the age of seven years. Driggs and Mihm (1990) asked parents to observe the children and make comments on any behaviour that may be difficult for the researcher to understand. Neelankavil et al. (1985) identified mothers as an important feature of their technique for obtaining information from very young children. Elliot (1979) on the other hand stated that researchers should not have parents present if they wanted to get a correct response. Wells (1965) also remarked that the mother should be removed in order that a good rapport could be built up between the child and the researcher.

2.5 Consumer Research Techniques

2.5.1 *Observation Analysis*

Richer (1980) looked at the value of observation in terms of collection of information from consumers. He gave an example where a child's construction toy contained many fiddly bits. This fact was well noted by parents, although they did not raise particular concern. However no one had noticed how children put the toys together. The instruction manual contained finished diagrams but no step by step instructions. When observed it was noted that the children chose the model and started construction from the outside and therefore this made the job of completing the inside very fiddly

and the child lost interest. This fact was not found out from discussions with the children or adults.

Schraidt (1991) noted, briefly, the work of the Children's Television Workshop, of Sesame Street fame. They tested their programmes on three and four year olds, using panels. The panels were small and in informal settings. The children played and interacted while being watched by expert observers who recorded and interpreted the activity. They used this information to adjust the programs before they were aired.

While observation analysis is a technique on its own right it is also used in conjunction with other research techniques to confirm findings and collect valuable non verbal information from children. Children often say and do different things. Observation analysis allows these differences to be identified (Cocks and Adams, 1978). It is good practice to observe younger children to get a fuller picture of their response (Lebender, 1978) For example, in an interview if a child is given a food product and they eat the lot they like it. If they say that they like the product and do not eat it you may like to draw your own conclusions (Cocks and Adams, 1978). Children can answer yes or no before they have understood the question especially under the age of four (Lebender, 1978). Observation analysis can be used to verify answers.

Other people can also observe sessions with children. Parents and caregivers can often shed light on a behaviour that the researcher does not understand (Marney, 1991; Schoenfeld, 1991) Clients can also observe so as to get a better understanding of their target market and its requirements and how children actually react to, and use, their products (Greenbaum, 1988)

2.5.2 *Projective Techniques*

Projective techniques are obviously a good place to start when working with children as they encompass activities that are part of a child's school work

and play. Gordon and Langmaid (1988) suggested these examples that have proved successful.

Projective drawing is an extremely versatile technique especially with very young children. The technique is an extremely simple one, but the children need plenty of materials, space, and time. They need a chance to practice and to be encouraged to draw what they want. It is beneficial for the researcher to join in, while watching for copying, and discuss the meaning of each picture with the child concerned. Assumptions are to be avoided. It is a good idea to get clarification if you are not sure what a drawing means.

The children are comfortable with drawing and it can overcome difficulties in articulating certain ideas and therefore give a better understanding. It does not set up a question/correct answer situation such as in school. Projective Techniques engages the child, not the pretend adult, which is particularly important with children's products such as toys, and it breaks down posturing.

Sending postcards is a useful way to find out what they think or want in an event or place. A postcard is sent to someone drawing and/or describing the event or place. In this way information is collected on what they remembered the most or what they would really like to happen there.

Word association and *story or sentence completion tests* are carried out in much the same as with adults but it is a good idea to play word association/sentence completion as a game where the children drop out if they cannot think of another word or finish the sentence.

In *picture construction* the children can be given some pictures or magazines and asked to make a collage to represent a theme or topic. For example, What is in fashion or what is a good holiday? This technique is better for older children.

Story Writing. Children in schools write stories every day so this technique is simple for them to do. The sophistication of the story increases with the development of the child.

According to Gordon and Langmaid (1988) projective techniques should be used because it gives the researcher an understanding from the child's perspective as well as access to the child's latent and manifest knowledge and beliefs. It is easy to see which product concept presented is of most interest to the children. It helps children to communicate product brand perception and attitudes. It enables a researcher to see what children really know about a product and what false beliefs they may have. Projective techniques can also be used to invent new products.

2.5.3 *Verbal Advertising Testing*

Neelankavil et al. (1985) developed a technique to obtain market related information from young children. The unique point of difference is the manner in which it verbally involved the young child through the mother and it was also cost effective with only a 30 minute interview. This technique involved six steps where the focus of the research started on the mother and moved slowly to the child as the child became more confident. Table 2.3 gives a description of the process.

Table 2.3: "Verbal Advertising Testing Among Young Children" Technique

-
- Step 1: Interception. Mothers with children were intercepted in a shopping centre, for example, and were asked to participate.
- Step 2 : Mother's Confidence Gained. The test was explained to the mother and she was told that the child was the focus.
- Step 3: Exposure to Commercial. The mother and child were shown the food commercials being tested.
- Step 4: Initial Questions: In this phase the mother was questioned about the foods she and her child liked best and so on with the mother doing all the answering.
- Step 5: Introduction of Scale: A Smiley scale was used by the mother to indicate preference and then the child was encouraged to try to do the same.
- Step 6: Test: The mother was questioned about the commercials but she passed the questions to the child to answer in order to get responses from the child. After a couple of questions the mother was not needed in the process any more and the questions were directed at the child.
-

This process produced intelligent, meaningful and unbiased responses from young children. To test and validate the technique Neelankavil et al. (1985) looked at consistency of data, richness of response and reasonableness of the data. Consistency of the data was demonstrated with a correlation coefficient of 0.9 between two different measures of preference. They understood what was expected of them and could articulate their choices. A correlation coefficient of 0.73 between the two age groups (5/6 and 7/8 years) also showed reliability.

In terms of richness of response, the children were tested for their ability to recall a slogan verbatim without assistance. Just less than fifty percent of the five and six years olds and sixty percent of the seven and eight year olds could manage this task.

Data cannot be meaningful without being valid and this was tested by looking at the reasonableness of the responses. The older children liked the more sophisticated commercials as expected and to check for mothers' bias they

were also asked to rank the commercials. A correlation of 0.2 between children's and mothers' results showed that there was little mothers' bias present.

2.5.4 Matched Pairs

The Matched Pair Technique, devised by Elliot (1979), is a compromise between interviewing children as groups or as individuals. Children were matched as pairs in terms of similar age, sex, education, locality and socioeconomic background and other skill factors depending on the tasks required.

The advantages of this technique over individual interviews was that the child was not the only focus for the interviewer therefore reducing the unease that may result from such attention. The child can relate to two reference figures and communicate laterally with their peer and the adult increasing the depth and variety of the information that can be collected. The children can ask each other questions in their own words minimising the effect of the adult. The Matched Pair is more relaxing than a group situation which enlarges the level of response and removes the bias effect of dominant children in the group situation (Elliot, 1979).

2.5.5 Product Testing

Schwentner (1978) looked at the testing of products by children in his work on prediction of the success of ice creams in the market place. Table 2.4 gives his recommendations for testing products on children. He stated that while many things affect the performance of children in a research situation these should not be used as excuses not to test at all. The critical and creative potential of the children should be harnessed to develop products for their use. In terms of the validity and accuracy of the results, he found that with the ice cream testing, comparing market research predictions versus actual success in the market, all the discrepancies were due to poor test design rather than the problems of obtaining reliable data from children.

A good technique is for children to bring along their favourite product to compare with the new one. They should not be asked to choose between them but they should be asked what they think is better or worse in the respective products. Monadic testing should be avoided, better results can be obtained through comparison. Children should not be asked which product they like, as they may like them all, but which product they like the most (Mayes, 1980; Fraley, 1987). Table 2.4 gives recommendations for testing products with children (Schwentner, 1978; Mayes, 1980; and Fraley, 1987)

Table 2.4: Recommendations for Testing Products with Children

Testing procedures should be streamlined to their behaviour, simple short tests prevent overtiring and wrong reactions.
No rating methods should be used with children under 8 year old. Use ranking with the number of stimuli no more than 3. If rating used, scales should be easy to understand and adapted to the way they already think. Over 12 years can use adult scales.
Stimuli should be realistic but dummies can be used to check colour, shape etc.
Distinguish between selection tests and acceptance tests. Selection tests are used for product development to select the best products. Acceptance tests are used to predict market success and these products should always be compared to successful products already on the market for the best results in Go/NoGo decisions.
Use the correct target market.
Blind or branded affects the results, full information may require several tests.
Children have a feeling for value for money and price should be included in market acceptance tests.
Wearing effects of products are hard to test, need to perform longer running tests.

It is important to define the product field so that everyone is clear what is being discussed and this may require inventing fake brands and packages to show what is meant. Often brands and labels do not actually mean much as the children see them as illegible logos and unpronounceable brand names. Therefore popular products can have low brand awareness even though the products themselves are popular with the children. Use illustrations of products or get the children to describe the brands and/or labels and determine what they are from the description.

2.5.6 *Multi Dimensional Scaling*

Bahn (1986) conducted a study examining children's discrimination and preference formation. He used multidimensional scaling to look at children's perceptions and preferences for cereals and beverages. He used two groups of children aged four/five years and eight/nine. This choice of ages gave two different developmental stages (Pre-operational and Concrete Operational). He found that the number of dimensions underlying children's brand perceptions and brand preferences differed slightly by cognitive stage and also by product category. As expected the Concrete Operational children handled the task better than the younger children. The older children used more attributes, were more consistent and homogeneous in brand perceptions and preferences. Over time, the Pre-operational children were less consistent in preference.

2.5.7 *Child Oriented Techniques*

Sorting and Mapping Games can be easily played by children. When sorting items into categories children under nine years will use pragmatic attributes rather than conceptual ones. Attributes decided by the researcher gives a more structured approach but spontaneous sorting shows what categories children use (Gordon and Langmaid 1988).

Labelling can be used with six and seven year olds that may find sorting difficult. Each attribute is on a card which the children put next to the product if it applies and away from the toy if it does not. Another variation is the Postbox technique where a child can post appropriate feelings about a product into box next to the product. Ten to twelve year olds can use a matrix to achieve the same results, that is, either tick the boxes of the attributes that apply or even score each attribute (Gordon and Langmaid, 1988).

Children love to act. Role playing and enactment are two good techniques to find out what is happening in a situation. For example, the shopping game

where you ask them to pretend to be mum and pick which product they would buy; when they reach the check-out ask them why they bought it. Another variation involves acting out advertisements or real life to see what they see in the advertisements or what roles are really being played in the family, or who uses what products (Gordon and Langmaid, 1988).

Drawing is not a technique used routinely with adults for consumer research but is a most successful one to use with children. Grabner (1980) used drawings to collect information on the impact advertising has on children. They were asked to draw the advertisements they liked best and least. All the drawings were discussed to determine the meaning. The activity took place in groups of nine or ten children and advertisements in general were discussed before the children started to do their drawings. This technique proved most successful as the children could express clearly what they saw in the advertisements and how they understood them. This information would be difficult to obtain from an interview because adults see the advertisements differently so may not think to ask the right questions. Children like to personalise their work and allowing them to colour in their exercises, answer sheets and scales is a good idea (Schoenfeld, 1991).

Schoenfeld (1991) advocates giving the children lots of concepts to look at and then asking them what they remember. Their poor memory can often produce creative results.

Accompanied shopping is a technique suggested by Gordon and Langmaid (1988). During the shopping expedition, the children are asked questions on the products they see and want to buy. With younger children, under seven, this technique can last about half an hour. With older children over an hour is possible.

Family interviews are another way to collect important information from children. While the children may tend to be dominated it does have the

advantage of stopping the children making untrue statements. Stating, for example, they never play with dolls when they do. In this case, other members of the family are there to correct them. A family interview can last up to two hours.

2.6 Children Working in Groups

Much has been written on working with children in groups although the opinion on the success rate varies. Elliot (1979) stated that groups are not a good way to obtain information from children, whereas Jenkins and Harrison (1990) felt that groups are the only technique that works. Elliot (1979) stated that a group of six to eight children all the same age and sex, means that the peer group influences are uncontrollable especially if they are boys. On the other hand with individual interviews the child sees the researcher as someone in authority and reacts accordingly. Either situation is not perfect.

2.6.1 Types of Groups

Specific types of focus groups were identified and analysed by McDonald and Topper (1988). The three group approaches were defined as: creative drama, adult oriented approach and structural approach.

Creative Drama: Games combined with drawing and acting out. Children are treated like children, and are expected to perform child-like activities. High degree of creativity from the children expected and encouraged. In common usage by market researchers to develop new product concepts

Adult Oriented: Child treated as miniature adults. Usually moderators with no experience with children. No special games or activities, no special methods or consideration given to stage of development of the child. Children are expected to behave as adults which assumes adult cognitive skills which children do not have.

Structural Approach: (developed by McDonald and Topper, 1988). Children treated as individuals at different stages of development. Use of games, activities and special methods. Children treated as children. Creativity less important, holds the middle ground between the other two techniques. Children involved in a task evaluation role. They are in a classroom play/learning situation. An example to illustrate this technique: The children begin the evaluation of commercials by watching them twice and using photos pick out their least and most preferred scene. They then discuss their choices. The structure is provided by the photos which is more efficient at getting the information than sketching or using creative drama.

When evaluating the techniques for use with children, *creative drama* scored well on participation in group activities, enthusiasm for group activities, level of child creativity, rapport with moderator and richness of group responses and failed on, amount of usable information and number of topics covered. As expected, the *adult oriented* activity scored a "poor" in six of the seven criteria used in the evaluation. This technique, however, scored a "good" in the number of topics covered. The *structural approach* scored well in six of the seven criteria and "fair" on level of creativity. It was not clear how this analysis was carried out but it appears that they were subjective ratings based on observation and the running of the group sessions

2.6.2 Use of Focus Groups

Focus groups are a very versatile technique when used with adults and as expected this is also the case with children. Greenbaum (1988) stated that focus groups can be used with children to meet many aims, Table 2.5.

Table 2.5: Uses for Focus Groups with Children

Obtaining Ideas

- Get ideas for a broader product line.
- Get ideas of ancillary items.
- Generate new product ideas from children based on their needs, wants and desires.

Product Testing

- Obtain insight into the reactions of children to a new children's product.
- Gain insight as to the level of appeal of the product relative to other similar items.
- Expose the item to children and see how it might be used.

Project Management

- Reassess priority of development of products.
- Decide on killing the project if the reaction is negative.

Evaluation of Advertising

- Gain insight regarding the effectiveness of advertising
 - Measurement of overall reaction to the execution.
 - Check on believability of the execution.
 - Test clarity of the message.
 - Determine interesting and uninteresting elements of the advertising.
 - Generate language about a new product to use for advertising the product.
-

2.6.3 *Moderating the Groups*

Fraley (1987); Greenbaum (1988); Driggs and Mihm (1990); Marney (1991) discussed the following ideas with reference to moderating children. When moderating children it is extremely hard to keep them focused on the task at hand. It is a good idea to keep the groups small and shorten the time from adult groups. Creation of a relaxing atmosphere is most important. The moderator is an important factor in the success of the group. The moderator's style should be animated, friendly and flexible to create an atmosphere of comfort, trust and respect of each opinion. The moderator should not punish age appropriate behaviour, in the children, but have the ability to deal with disruptive children. If the children and the moderator develop an instant rapport they will see the group as fun. An atmosphere of mutual respect is ideal, with the children wanting to participate and the moderator appearing as a slight authority figure that leads the discussion but not controls it. To

create an interactive rather than an autocratic relationship, the moderator can dress in comfortable clothing and sit on a child sized chair or on the floor. The children will not respond to being talked down to or by being expected to come up to an adults' level. Eye contact is a good idea when talking to them. After the sessions the moderator can look for nonverbal communication to supplement his/her knowledge so probably a video of the session would be a good idea. As with all focus groups, an experienced moderator will make all the difference to the chance of success.

One way to ensure the smooth running of a group session is for the moderator to show the children what is expected of them, set standards of acceptable behaviour and, if possible, tell them the plan for the session at the start. A number of different activities can be planned for each session so the children do not get bored. Each child's opinion is important and an effort should be made to obtain contributions from shy children. It is a good idea to run warm up sessions and explain the rationale of no right or wrong answers. Sessions can last between 30 and 90 minutes with an activity change every 15 minutes.

2.6.4 Activities in Groups

Grabner (1980) had children in groups of eight or nine drawing pictures of their best and worst advertisements. This was done so the discussion about the drawing was not seen as an examination situation, a feature of one to one interviews.

Greenbaum (1988) suggested that projective techniques should be used to get the most out of children in groups. Techniques such as unstructured and structured fantasy play, role playing, fantasy wishes, sentence completion, first word or thought and drawing.

2.6.5 General Rules for Children's Groups

Much of the literature deals with the "rules" for running groups of various sorts with children. General agreement appears to have been reached by researchers in the area (Fraley, 1987; Gordon and Langmaid, 1988; Greenbaum, 1988; Marney 1991; Schoenfeld, 1991; Guber and Berry, 1993) and is summarised in Table 2.6.

Table 2.6: "Rules" for Conducting Groups with Children

Have food and drink available.
Know what will happen, and tell the child.
Work at their physical level.
Make sure they understand and give practice time and help.
Start off sessions with something familiar.
Respond to signs of tiredness and boredom by stopping.
Spend only ten to fifteen minutes on each activity.
Sixty to ninety minutes is long enough for a group session. Some say as short as thirty minutes- depends on skill of moderator, time of day, subject being explored.
Do not criticise or praise one individual, always the whole group.
No more than seven or eight members per group (five or six seems the preferred number).
Single gender groups work better with certain age groups (six to nine years) and with gender specific products.
Children all the same developmental age.
Large rooms, open spaces, small tables and chairs. Must look like a children's room not an adult's room modified for children. The room should not look like a school room.
Give the children authority, they know something that you do not.
Make it a shared experience, you break the rules too.
Give permission to criticise, children are usually honest.

2.6.6 Setting the Right Atmosphere

When setting the right atmosphere the first few minutes of the session are extremely important. The aim of the first few minutes of any group should be to help children get to know each other and let the children bring something of themselves into the room. To do this the moderator should provide a safe, secure, environment that is not physically or psychologically daunting and explain what will happen and what is expected for them. Like adults, children like to have a practice of a new activity first and it is a good

idea to tell them they do not have to get it right first time. Ask the children what they expect and what they would like to happen and always tell them the truth about what is going on (Greenbaum, 1988).

2.7 Scaling Techniques

The problem with scales and children is that scales are intended to measure a degree of feeling which children find difficult to express. They can express simple comparisons such as, better or worse, but a battery of scales can quickly lead to boredom and no discrimination. Lebender (1978) stated that scales in children's market research must be simple and clear so that the interviewer influence can be held down as low as possible. In practical terms, this means that the child must be able to handle these scales with no difficulty and that not too much is demanded of their reading and writing capabilities. Prolonged explanation and testing of understanding takes time and moves the child's thoughts away from the problem under investigation.

About school age is the earliest a child can be expected to competently handle a variety of scales. The child must be able detect a difference among objects of the same type on the basis of different details. That is, they must be able to perceive differing sizes and shapes of objects and be able to tell the differences of varying amounts. At school age they also have the ability to repress their own ego to view objects realistically and objectively, and are able to abstract from concrete fact and to think conditionally. To do this they must be able to recognise the objects in their own terms and must be able to represent their attitudes towards these objects by means of a scale, the system of which they must understand (Lebender, 1978).

2.7.1 *Smiley Face Scale*

The Smiley Face Scale is a scale that uses faces showing different expressions. from very happy to very sad, to allow the consumer to represent how they

feel about a product. Various versions of the Smiley Face scale have been used over the years as shown in Figure 2.1 (Wells, 1965; Neelankavil et al., 1985). Use of the Smiley Face Scale with children removes the problem of using an unknown word in the scale. Children have little difficulty understanding the scale but tend not to use the bottom end of it (sad face) (Mayes 1980).

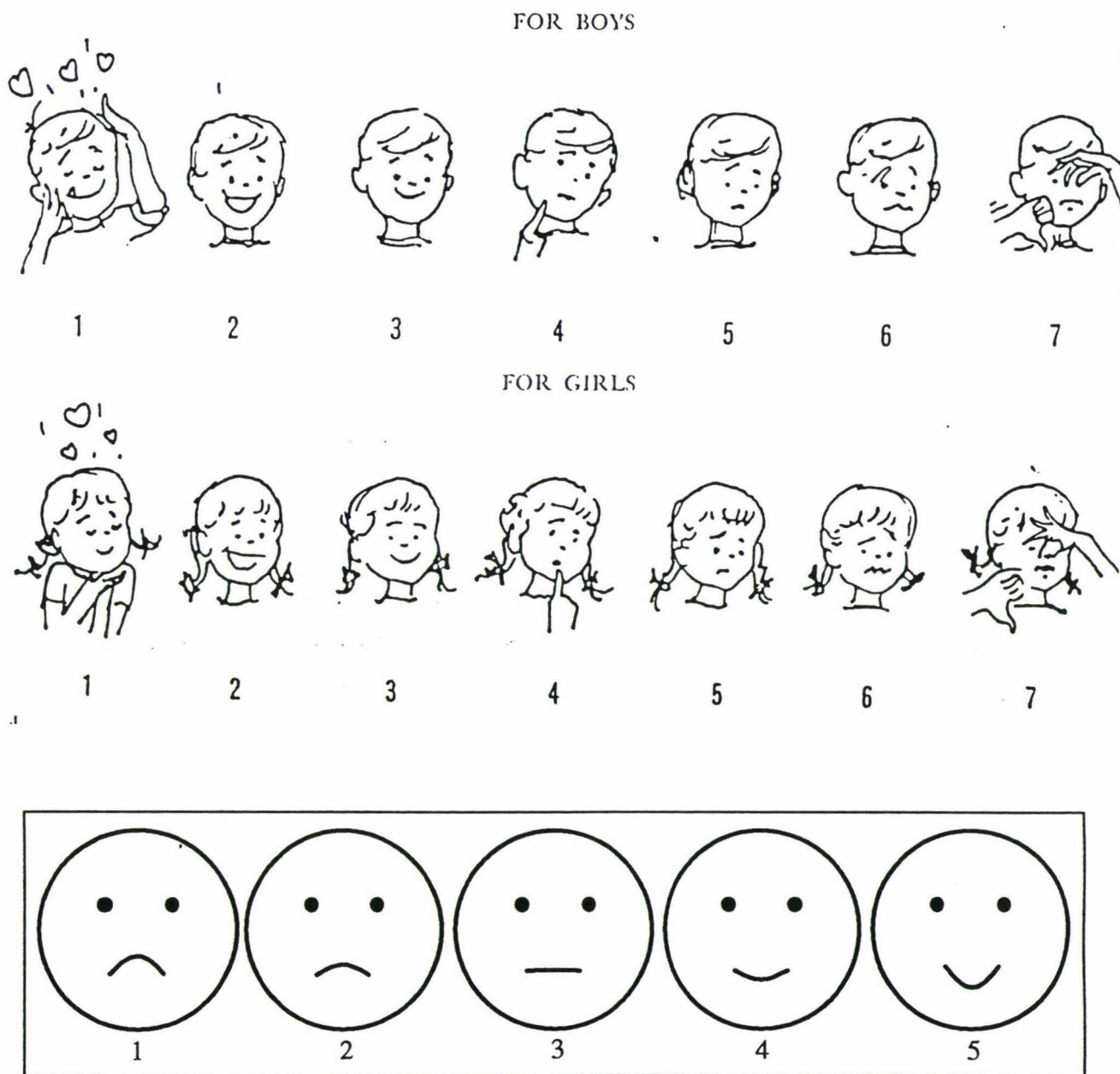


Figure 2.1: Smiley Face Scales

buzz words, to include a diagrammatical shape to indicate strength of feeling and to use a mid point that is not neutral to make the children use the complete scale. Verbal scales do not require much explanation to use because children either understand them or not. Gorn and Florsheim (1985) used a four point scale when children were asked to choose between two brands of lipstick, Figure 2.3(a). Figure 2.3(b) shows another type of verbal scale using Yes and No as well as definition for amount of agreement. This was used to test advertising with children.

- ___ Definitely the unadvertised brand
- ___ Maybe the unadvertised brand
- ___ Maybe the advertised brand
- ___ Definitely the advertised brand

Figure 2.3(a): Four Point Scale used by Gorn and Florsheim (1985)

- ___ YES - I agree very much
- ___ YES - I agree
- ___ NO - I disagree
- ___ NO - I disagree very much

Figure 2.3(b): Four Point Verbal Scale used by Riecken and Yavas (1989)

Figure 2.3: Verbal Scales used with Children

2.7.4 Stage Rating Scale

With the Stage Rating Scale the more they like the product or the more positive the attribute the higher up the scale they point. The Stage Rating

scale is shown in Figure 2.4. With no words this scale is easy to understand but tends to produce more positive results than negative (Lebender, 1978).

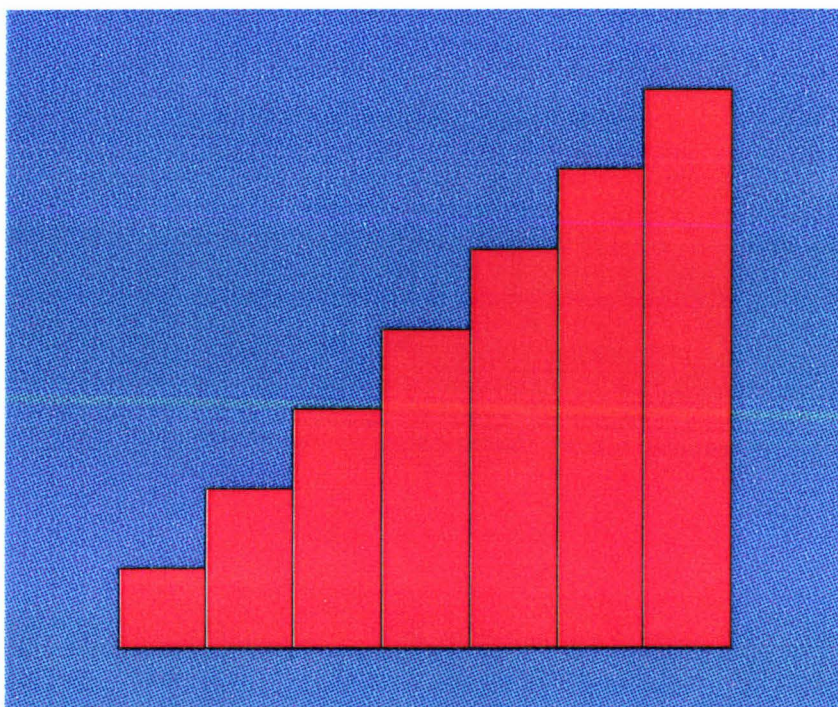


Figure 2.4: Stage Rating Scale

2.7.5 Audio Visual Children's Scale

The development of the Audio Visual Children's Scale was an attempt by Lebender (1978) to give children a simple clear scale that was not too demanding on their writing and reading abilities. Operated by the interviewer, the faces on the scale light up in turn with children's voices giving negative and positive opinions as answers to the question being asked by the interviewer. The children then choose the face and voice that best reflects how they feel. It is suitable for six to fourteen year olds. The Audio Visual Children's Scale is shown in Figure 2.5. The Audio Visual Children's Scale gives a more normal distribution than is experienced with other scales

that tend to produce more positive scores than negative ones when used with children. The main disadvantage of the Audio Visual Children’s Scale is that it takes a long time to use. Explanation of the scale is important so that they understand it is the same child’s reaction to different products. The scale must be played each time the child makes a choice for each attribute, for each product, which is extremely time consuming. If a number of prototypes are to be tested this scale is not suitable.

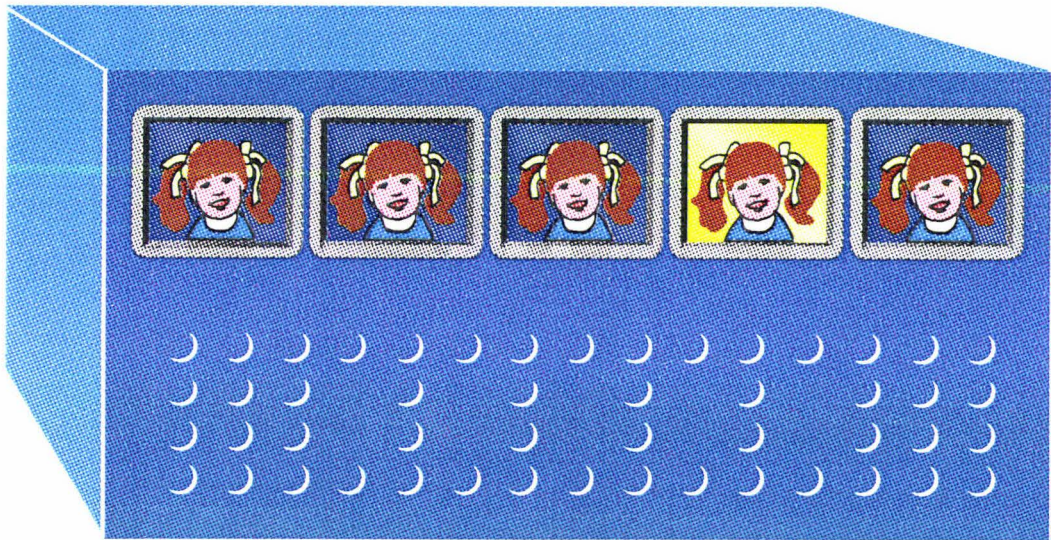


Figure 2.5: Audio Visual Children’s Scale

2.7.6 *IVE Flachenscale*

The IVE Flachenscale is a nonverbal, unipolar, graphical scale in which the different stages are represented by rectangular boxes of differing size which is shown in Figure 2.6. The distribution of the results on the scale can be influenced by the careful choice of scale values (words) in order to obtain a normal distribution. It is inferior to the Audio Visual Children’s Scale in this respect. The stability of the scale however is good (Lebender, 1978).

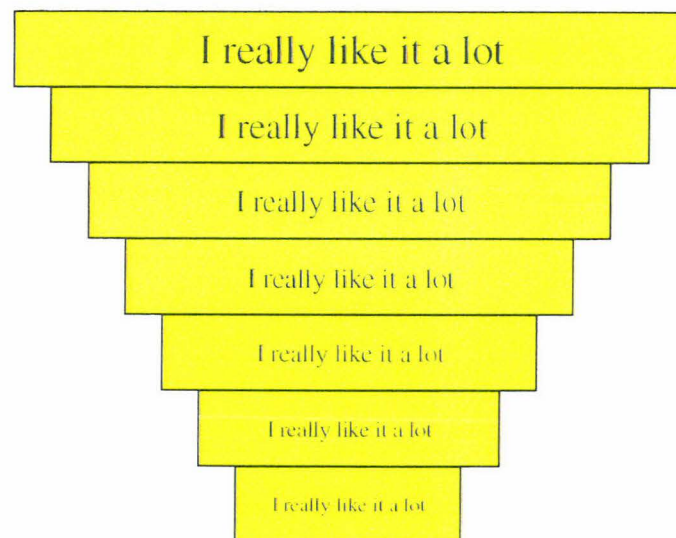


Figure 2.6: IVE Flachenscale

2.7.7 Evaluation of Scales

Kroll (1990) worked with children to develop scales for sensory testing of food. Children (5 to 10 years) were tested using one-to-one interviews and older children (8 to 10 years) were given self administered questionnaires. The children were tested with three, seven and nine point scales. Only the nine point scales were described in Kroll's (1990) paper. The scales were in three forms; traditional hedonic scale, a face scale and a P&K scale specially developed for the test (Figure 2.7).

The nine point scales of all types were rated better for use with children than the three and seven point scales in the tests described above. The P&K scale performed better with the children than the Smiling Face which was marginally better than the Hedonic scale.










<i>Traditional Hedonic Scale</i>	<i>P&K Scale</i>	<i>Face Scale</i>
Like extremely	Super good	
Like very much	Really good	
Like moderately	Good	
Like slightly	Just a little good	
Neither like or dislike	Maybe good or maybe bad	
Dislike slightly	Just a little bad	
Dislike moderately	Bad	
Dislike very much	Really bad	
Dislike extremely	Super bad	

Figure 2.7: The Nine Point Rating Scales used by Kroll (1990)

Lebender (1978) compared the Stage Rating Scale, Audio Visual Children’s Scale and the IVE Flachenscale and found the Audio Visual Children’s Scale produced the most reliable and accurate results with children aged six to fourteen years, however it was very time consuming to use. All three scales produced more positive results than negative ones, a fault also found with the Smiley Face Scale (Mayes, 1980). Lebender (1978) does not say how inferior the Stage Rating Scale or the IVE Flachenscale were to the Audio Visual Children’s Scale or whether the scales relative performances altered with the age of the child using the scales.

2.8 Questionnaires

2.8.1 Behavioural and Awareness Questions

Recall of purchase and consumption is more of a problem with children than adults. Children are often unaware of items they have purchased, therefore frequency questions are often unreliable, over-claiming or under-claiming occurs depending on the product in question. Children can often recall the

number of things they have just brought but because they have trouble with large numbers and only remember favourite items, it is often necessary to count the number in the child's cupboard and check brands.

2.8.2 *Attitude Questions*

It is important to only ask attitude questions that are salient to the child. They are very self centred and therefore they are unlikely to have an accurate opinion on what other children may think about a product unless the product is particularly relevant to them at that particular point in time. For example, the fad product of the moment. It is appropriate to confine attitude questions to what they think about a product rather than getting them to comment on other people's opinions.

2.8.3 *Ranking Questions*

An alternative to scales, ranking is quick and simple to use. The interviewer can simply ask which product is the sweetest and so on. Children cannot say how hot but can say which one is hotter. For example, if a child is given three chocolates and ask which one they like they will say all three because they are all chocolate and they like chocolate. Children can, however, put them into order of preference and say which they like best, least and in the middle. Comparative rather than monadic testing is preferred to get an accurate picture of preference of products. (Schwentner, 1978)

2.8.4 *Open-ended Questions*

Used extensively because they do not require special instruction to use and do not distract the child from the interview. Children can use their own words when answering but this can be a problem when the child does not have the verbal skills to express what they want to say. Another problem is it takes a long time to record the data for later consideration. It is best used where children have a high level of interest and therefore have a high vocabulary on the topic. In any case interpretation requires a lot of care as it is an adult interpreting a child's mind. Children's verbal skills may not

match with the concept they have in their head. Open ended questions can be very stressful for the child if they do not know what sort of answer to give. (Lebender, 1978)

2.8.5 Interviewing Techniques

Beginning of the interview is important and the child needs to understand the kind of dialogue that will be required. The child needs to make sense of the situation. The Interviewer's body language may send messages of pupil/teacher relationship and therefore indicate a question and answer session. Poor choice of initial language can also ruin any chance of rapport. Choice of location is important, not laboratories or offices, nor their own home but another person's home or other comfortable environments are best. Interview responses must be monitored carefully to check for comprehension and consistency. Children hate redundancy and being checked up on, so the child can easily switch off if the adult appears to be thick and repeatedly asks the same sort of questions (Cocks and Adams, 1978).

Rodnight and Williams (1984) collected their information using semi structured interviews. The interview lasted one and a half hours. In much of the literature one-to-one interviewing is the preferred method with children. Kroll (1990) found that the eight to ten year olds handled the self administered form well and showed that the extra expense with one-to-one interviewing with this age group was unnecessary.

2.9 Ethical Issues

As this project involved the participation of young respondents ethical issues were most important two groups gave guidance. The Market Research Society of New Zealand has a Code of Marketing and Social Research Practice and Massey University has a Human Ethics Committee that makes recommendations on projects being undertaken by University Staff.

2.9.1 *Rules of Conduct*

Very little has been written in the literature in terms of specific rules on conducting consumer research with children. The Market Research Society of New Zealand has a Code of Marketing and Social Research Practice (Appendix 3.1). Article 9 of the code, p 77, states; " Special care shall be taken in interviewing children under 15 years. Before they are interviewed, or asked to complete a questionnaire, the permission of a parent, guardian, or other person currently responsible for them (such as the responsible teacher) should where practicable be obtained. In obtaining this permission, the interviewer shall describe the nature of the interview in sufficient detail to enable the responsible person to reach an informed decision. The responsible person shall also be specifically informed if it is intended to ask children to test any products or samples." It is also reasonable to assume that general rules in the handbook related to respondents are also applicable to children involved in consumer studies, see Table 2.7.

Table 2.7: Rules of Conduct for New Zealand Market Researchers

That statements to secure cooperation be factually correct.
The right to anonymity, unless consent given.
That no misuse of the information collected will occur.
The right to withdraw or refuse cooperation at any time.
The right to have the material collected, destroyed if requested.
The right to be told of recording devices, unless in a public place.
The right to know the name of the research organisation and contact details.

Massey University has a Human Ethics Committee. They give guidance and advice on ethical issues, where research projects involve human participation of any kind, in their booklet; "Code of Ethical Conduct for Research and Teaching involving Human Subjects". The Human Ethics Committee has clear principles when a project involves human participants (Table 2.8).

Table 2.8: Massey University Human Ethics Committee Principles

Informed consent must be obtained from the participants.
Confidentiality of the data and the individuals providing it.
Minimising harm to all participants in the project.
Truthfulness in information given to participants.
Social sensitivity to age, gender, culture, religion and social class.

The rest of the code of practice covers much the same areas as the Market Research Society's code but it is worth noting the following two statements with particular reference to children:

" In particular staff must recognise the power relationships involved in their work particularly where there are age, race, cultural, religion or gender disparities between researchers/teachers and their human subjects or where the persons involved belong to vulnerable groups (e.g. the mentally ill, the socially disadvantaged, young children)" (Massey University, 1990)

"In the case of children, the aged, the disabled and the mentally ill special care is needed. Wherever possible their informed consent should be sought. Where that is not possible, the necessity of the research should be seriously questioned. If the research is necessary and can be so defended, the informed consent of the guardian must be obtained. The researcher must be sensitive to conflicts of interest between guardian and subject and the subject must be informed to the fullest extent possible" (Massey University, 1990)

2.9.2 Obtaining Consent from Caregivers

It is obvious that in any consumer research that consent from a parent or caregiver is vital if a child is to participate. In the 1984 paper by Thompson on consent rates from parents to allow children to participate in social research, it appears that if you can receive a reply from the parents to the

consent request, then you usually get consent for the child to participate. The problem is encouraging the return of the forms. The children in Thompson's (1984) study were recruited at a school and the following techniques were tried to increase the consent rates.

A letter home gave a consent rate of 47%, 51% were not returned and 2% denied consent to participate. Communication with the child, before the form was sent home, explaining what the research would involve, increased the consent to 71%, with a non-return of 27% and denial of consent of 2%. When an incentive was offered to the child to bring the form back the non-return rate dropped to 15% with 82% giving consent and 3% saying "no" to participation. An incentive to the parent of copies of research reports if they returned the form, whether they gave consent or not, gave similar results. Communication with the parent by phone call on the day the letter went out gave the best results with 97% giving consent, 2% were not returned and 1% denied consent to participate.

2.10 Implications To The Project

An attempt was made to assimilate as much of the previous research as possible into this project, where it was applicable to the first stage of the product development process. As the focus of the project was on group work with the children this was used as a criteria when selecting suitable techniques and activities.

2.10.1 *Screening Children for Participation*

The children selected for the study were between the ages of six and nine years which puts the six year olds at the end of the Pre-operational stage and the seven to nines in the Concrete Operational stage of Piagets' stages in cognitive development, as defined by Berger (1983). It was felt that children in this age range would be able to cope with the activities that were planned

and were sufficiently different from adults in their development that techniques needed to be modified to accommodate them. Children under the age of six were more likely to not have the cognitive ability to read or write at the level required, to concentrate on the tasks for the length of time required or have the understanding to scale the products for tasks like order of preference. On the other hand some children above the age of nine would have had the cognitive capacity to handle the techniques in much the same way as many adults do.

It was clear from previous research that some form of screening was desirable. This was not possible due to the constraint of no screening placed on the project by the Massey University Human Ethics Committee. The Human Ethics Committee felt that the children would feel the reason they were removed from the project was because they were not as good as the other children. This would have caused them harm. This inability to screen meant that a post activity screening had to occur to remove any data produced by children that had failed to complete the task properly. This did not prove to be too difficult and enabled any child to be removed from the data for any specific activity they failed to master. Error may have resulted from researcher bias in removing this data but only where evidence was shown that the children had failed to complete the task correctly was the data removed. This resulted in as little data as possible was removed from the project. Often the younger children, six and seven years, were not consistent in terms of their ability to perform the activities from week to week. Some of the children however could not manage to complete any of the tasks required with any accuracy and it would have been desirable to have removed them at the beginning.

2.10.2 The Individual Child and Children in Groups in Consumer Research

Care was taken with the language and an attempt was made at all times to use words already used by the children. When explanations were needed the

children were encouraged to explain it to each other. Written instructions were kept to a minimum.

Checks were included in the activities to ensure that the children were producing accurate and valid data. They were only asked questions they had the skills to answers. Where possible consumer techniques were altered to accommodate the abilities of the children.

The children were always given a chance to explore and play with products before being asked about them. They were also able to use the products provided to help to explain themselves better in focus groups. While the concepts for new products were written by the researcher, the children had a clear understanding of the product group from previous sessions and had a clear picture in their minds what the product would be like, for them. They were at no time asked to imagine a product type they had never seen.

The children were not asked many questions that related to their ability to remember specific details. They were asked on two occasions how many toys of a particular product type they had. The actual answer was not all that important, rather the magnitude of it. Most of the data being collected, on how much they liked a product and how this related to other products, did not rely on memory.

A single gender, female, was used for the Small Group study to removed any of the problems that can be encountered when both genders are present in a group situation. It also simplified all analysis and the choice of toys to work on. A mixture of friends and "strangers" were used in the groups as it was not possible to have all one or the other.

All the activities were conducted in groups with the children rather than on a one-to-one basis with the researcher. For the Small Group Study the groups were kept to eight female children all of the same age. A session only lasted

a maximum of fifty minutes with each activity only taking a maximum of fifteen minutes. The children were treated as children by being allowed time to play, express themselves how they wanted to and they were able to "start again" if they felt they had made a mistake. The sessions were conducted in a classroom where they felt comfortable.

2.10.3 The Research Environment

The research was conducted at the children's school so the environment was not unfamiliar and frightening. The researcher built a strong relationship with the children over the period of the research, either in the sessions or around the school grounds during other visits. The topic of toys helped with the researcher being known about the school as the "Toy Lady".

Warm up techniques were used in all sessions and these varied depending on what activities were to follow. The techniques used always involved getting all the children to talk about a topic of interest to them, to get them into a communicating frame of mind.

Motivation was offered to keep the children coming to the sessions. A certificate was used with the children receiving stickers for participation.

Excitement of the children for the research was a little difficult to prevent. At the start of each session a "play time" was given in an attempt to get it out of their system before the activities started.

The activities were conducted during school hours so there was no need to have caregivers present. A teacher was present at the Group Introduction which helped by giving the children a familiar adult in the room as they had never met the researcher. With the younger children the teacher also helped the children complete the questionnaires.

Developing a rapport with the children was not difficult, and it was aided by the fact that the topic was toys. In the first session with each of the Small Groups the researcher played with the children and talked to them about the toys. In all the sessions the researcher always sat at their desks on their chairs rather than at the teachers desk. Any opportunity was taken to sit on the floor and participate with the children during the sessions.

2.10.4 Consumer Research Techniques

Many techniques that had already proved successful with children were used in this project to try and achieve the aim, which was to involve children in all steps of the first stage of the Product Development Process; from idea generation to a product concept.

Observation proved useful in the screening process. During the activities the children were observed for signs of difficulty and their names recorded. After the session their work could be examined with a view to removing it if necessary from the data set. Observation also provide a lot of background material that was useful when analysing results.

Projective techniques were used as they are an obvious choice for research with children allowing them to express themselves in a way that is familiar.

Multi Dimensional Scaling was another technique that was tried with the children in an attempt to see how they would manage such a quantitative technique, that required a large number of scales to be completed.

The ideas for child orienting the techniques were incorporated in many of the activities. Turning techniques into games, using cards for sorting and encouraging them to personalise questionnaires with drawings and colouring in scales were all used.

Several different scales were using during the study. The Smiley Face Scale and a Verbal Scale were used for scaling new product concepts and a numerical scale was used to collect data for analysis by Multi Dimensional Scaling. The children were also given open-ended questions to find out why they liked or did not like a product as well as ranking questions to put sets of products into order of preference.

2.10.5 Ethical Issues

Ethical issues were a major part of this project due to the fact that the participants were children. At all times it was considered that the children owned the research and by implication as they were under the age of consent so did their caregivers. The project included many features that reflected this. The main features were a constant reporting of the results to the children and affirmation to the children of their right to refuse participation.

Chapter 3

Ethical Issues In The Research

3.1 Introduction

It is important to include ethics as an major facet of a consumer research project, especially when working with children. The rights of the child need to be considered at all times. Children are below the age of informed consent so in this research, continued and meaningful contact was required with teachers and caregivers. As there was a lack of detailed guidelines on the conduct of consumer research with children, the need to include techniques to protect the children during the project required considerable thought. Good ethical practices were observed and had to be approved by the Massey University Human Ethics Committee as well as ensuring that all rights of the respondents were protected as outlined in the Market Research Society of New Zealand Code of Marketing and Social Research Practice (Appendix 3.1). The child's freedom to refuse to participate, the reporting of the research findings to the children, caregivers and teachers, the destruction of tape recordings and the materials produced by the children, and the ensuring of anonymity, were all carefully included in the research.

3.2 Discussion with Members of the School Community

The principal of West End School, Palmerston North, Mr David Beere, was approached about the project. He approved the research in principle and then discussed the proposed study outline, on the researcher's behalf, with the staff at the school. Teachers involved in teaching children aged five to nine years were asked to consider the involvement of their class. A meeting was held with four interested teachers at which the project was discussed in detail with the researcher, based on a discussion document prepared by the researcher

(Appendix 3.2). The teachers were asked to identify specific areas of the project where they felt the children could be placed in a situation that was undesirable to their wellbeing, both physical and mental. The teachers raised no problems but did point out some changes that could be made to make the project more compatible with current classroom practices in the school. The teachers were also critical of some of the motivation techniques proposed, which they felt were unnecessary and inappropriate for the age group. These changes were incorporated by the researcher into the final project planning.

The chairman of the West End School Board of Trustees, Mr O'Hara, was approached about the project being conducted in the school. As with the teaching staff, he felt it was an interesting educational opportunity for the children, and he gave permission on behalf of the Board of Trustees for the project to proceed at the beginning of 1992. Caregivers' permission was not required for the Group Introduction as the school saw this experience as an educational one in terms of consumer studies, and therefore it was seen by the school as a compulsory classroom activity for the classes selected.

Caregivers' permission was required for the children to participate in the second stage. Before the commencement of the Small Group Study the caregivers of all the female children were contacted by letter (Appendix 4.1) which was handed out to each of the female children in their classrooms by the researcher. The researcher explained to the female children that they were to take the letter home and discuss with their caregiver/s whether or not they wanted to take part in the study. The letter could not be sent directly to the caregivers as it would have been unethical for the researcher to have access to the school address list without the caregivers' consent. By taking the letter home it gave the children a chance to put their point of view about whether they wanted to be involved in the project or not when they gave the caregiver the letter. The letter explained the project to the caregiver and asked for written permission for their child to participate. The consent form was then returned to the school giving the name of the contact caregiver and address.

This address was then used for further correspondence about the project when necessary. Two caregivers contacted the researcher to discuss the project. After their agreement, there was a one hundred percent positive consent rate from the parents.

3.3 Proposal to Massey University Human Ethics Committee

All projects based at Massey University that involve work with children should be approved by the Massey University Human Ethics Committee. This committee is made up of a cross section of the Massey University academic staff and representatives of interest groups from the local community. A document (Appendix 3.3) was prepared to outline the proposed events in the project and was submitted to the committee for consideration. When a researcher is involved in a project it is easy to overlook ethical considerations in order to obtain the results required. Presentation of the project to this objective committee enabled the work to be carefully examined and points of concern could be raised and resolved before the human respondents were involved.

The Human Ethics Committee raised grave doubts about one facet of the project. While the children were not going to be screened on ability to perform the various activities that would be required, it was felt by the researcher that they should be able to handle simple reading and writing so that they could participate in the second stage. One of the purposes of the Group Introduction stage was to be a screening procedure to select suitable participants for the study. The Ethics Committee suggested that this type of screening process would make the female children, not selected for the study, assume that they had been left out of the study because they were not as intelligent as the rest of their classmates. The Ethics Committee indicated that this was not acceptable. It was decided that the work could proceed if no screening occurred in choosing the children for the second stage of the project.

The committee also raised other points for consideration: ownership of the research results, reporting the results to parents and students, obtaining permission from the School Board of Trustees before proceeding with the project. All aspects of concern were rectified before the practical part of the project began.

3.4 The Childrens' Right to Refuse their Participation

For the Small Group Study where the children were removed from their classroom situation, safe-guards were included in the project to allow the children to exercise their right of refusal. The children could at any time choose not to attend a session or could leave a session at any time and return to class without having to give any reasons. This was made clear before and during each session with the children. A teacher could decide that a child should not attend any more sessions if they felt that the child was not enjoying the activities, was becoming distressed by having to attend or if it was affecting their other school activities detrimentally. Although caregivers had given consent for children to participate, they could withdraw consent at any time during the project without giving a reason. This could be done by contacting the school or the researcher.

3.5 Informed Choice of the Children

A Group Introduction was held in each of the four class rooms under the supervision of the class teacher. The children looked at some toys and completed a short questionnaire that involved answering some questions and drawing a picture. The session was to introduce the researcher and the project to the children and to give the female children a chance to learn about the project, so they could make an informed choice when offered the option to continue to the second stage. A question and answer session was held on

the second visit to the class to help the female children decide about further participation.

3.6 Reporting Information to Children, Caregivers and Teachers

Reporting of results to the children started very early in the project. The class room results were reported back to the children and the teachers after the Group Introduction. Each class was visited and the results for their class alone and combined with the other classes were explained to them in simple terms. They were allowed to ask questions and make comments on what was found in the Group Introduction.

In the second stage of the project, at the beginning of each session the researcher and the children were involved in a short discussion on what the "results" were from the last session. Care was taken to ensure that the results were in a form that was meaningful to the children. If a tape recording had been made, they were allowed to listen to themselves talking.

Each caregiver received a newsletter periodically during the project keeping them up-to-date with any necessary changes to the schedule and sample of the information that had been gathered during the project (Appendix 3.4 (a) and (b)). In each newsletter they were encouraged to contact the researcher with any questions they had. At the end of the project, all caregivers were invited to an end-of-project party for the children and were given an opportunity to discuss the project with the researcher. A short presentation on the project was made to the caregivers at this time.

An informal discussion was held with the Principal at regular intervals during the project and the teachers of the children involved were given opportunities to discuss the project with the researcher while it was being conducted. The school will also receive a copy of this report on completion.

3.7 Methods of Reward to Children for Involvement

Rewards could not be given in the normal school method during this project. This was not a teaching/learning exercise and therefore the normal praise for good work and correction of poor work did not apply. However the children could not be expected to participate in the project without reward. Immediately after the Group Introduction all the children who participated were given a certificate (Appendix 4.2) presented in their class as a reward for their involvement, not as a prize for giving the correct answers. The children in the second stage of the project were rewarded for their attendance, not performance, with stickers on a certificate (Appendix 4.3) at the end of each session. At no time was any judgement made on the quality of their work nor was their work compared to any other child in the group. When results were discussed they were reported as a group result not as individual ones.

A small gift and end-of-project party was given at the completion of the project. The party idea was seen as a way to thank the children for their work. Children, in much the same way as adults, appreciate social functions as rewards. The party was not used to motivate the children to participate as they were not told about it until the end of the project. It provided a way to recognise their work, as caregivers attended to see the certificate and gift presentation. Having their caregivers see them receive the award was important to most of the children.

During the sessions, care had to be taken to ensure that all children felt they had performed well. They found it hard to accept that all the work received the same amount of praise and therefore in their eyes was obviously of the same standard. They would sometimes point out the obvious error in this. The researcher had to often discuss the idea that this was a research project and therefore all the answers were of equal value. As this was difficult for the children to understand it was important that they felt their work was being recognised by these other methods.

3.8 The Childrens' Right to Anonymity

The children had the right to anonymity guaranteed to their caregivers. The caregivers were told that on reading the report an individual child would not be able to be identified. Unfortunately some of the children had difficulty understanding this concept and therefore wanted to know why their name should not be linked to their work. Most of the children actually wanted to be identified particularly if they felt their work was good.

3.9 Destruction of Study Materials

All tape recordings, drawings and other materials produced during the sessions were destroyed at the end of the study.

3.10 Discussion on Ethical Issues

As the respondents were children, ethics were an important focus of this project. The recommendations of the Massey University Ethics Committee required a modification of the project plan and the inclusion of features to protect the well being of the children and still obtain accurate results.

No screening was allowed so all the children in the classes involved participated in the Group Introduction and all the female children were asked to participate in the Small Group Study. For some of the children the tasks they were required to perform were beyond their present level of development and therefore each task had to have a check included in it and a way of identifying individuals to the researcher so their data could be removed from the sample without the children knowing. Questionnaires and written exercises always had names on them. Cards of different colours were used in sorting exercises so sets of cards could be removed later.

Time had to be allowed in each session to discuss the results of the last session. This meant extra preparation time to get the results into a meaningful form for the children as well as time in the sessions to discuss the results and answer questions.

The right to refuse to participate had to be reiterated before each session and before each activity. Only one child exercised her right on one occasion to return to class and on another occasion not to attend a session.

3.11 Conclusion

Considering ethical issues as equally important as the quality of the research basically requires a change of thought on the ownership of the research. After discussion with the Massey University Human Ethics Committee it was considered that the respondents owned the research and much of the alteration required to the research plan was commonsense. Ensuring adequate reporting was the most important component of the transfer of ownership to the children, caregivers and teachers. By reporting the information in an appropriate form to the various groups involved in the project they were given a real understanding of the research. This was necessary not only for them to make decisions, such as, further participation but as a basis to ask for clarification and to make relevant comments.

Chapter 4

General Project Techniques

4.1 Introduction

When planning the project two main factors needed consideration; the project environment and the techniques to encourage valid participation from the children.

Consideration of the project environment raised issues such as: the primary school system in New Zealand and possible effects on the project, selection of the children for participation, toy choices by children, how quickly children learn activities and how to obtain informed consent from the caregivers of the children.

General techniques to encourage valid participation from the children covered areas such as: motivation and reward, form of written materials, language of written and spoken material during the sessions. Also, how was the work to be made worthwhile and still seen as fun? In order to remove as many obstacles as possible for the children when participating in the sessions; use of familiar activities and cards, choice of timing and group dynamics had to be considered.

The project was in two parts; a Group Introduction and a Small Group Study. The Group Introduction involved four classes of male and female children at West End School in Palmerston North between the ages of five and nine years. The Small Group Study only involved the female children from the classes and the children were involved in four sessions; idea generation, idea screening, product concept development and product concept testing.

4.2 Project Environment

4.2.1 *New Zealand Teaching System in Primary Schools*

The ability to work in groups was important for the project. The New Zealand primary school teaching system is organised to encourage group work. Children of this age sit and work at clusters of desks in the classroom. They work on projects as teams and also complete individual work in the same setting. From the age of five, children work in groups for all their school work. They are familiar with working as a group or team, or working individually while still sitting in their group. This factor would have contributed to the success of this research. Other features of the teaching system would have also had an impact on the children's ability to do the tasks required of them. Children are encouraged to be enquiring and speak often in class discussions. The school situation involves story writing, drawing and sorting into sets/groups and these skills were used in the study.

4.2.2 *Selection of Children*

The children in the study needed to be at least six years old as a certain level of development (cognitive, physical, social, oral and literacy) was required in order for the activities to be completed. An upper age limit of nine years was set as it was felt that some ten year olds might be approaching adult ability in terms of some of the techniques.

It was also desirable to keep the range in ages to a three year period as toy preferences differ among the age groups so having a wider age range may have made it difficult to find a single toy preferred by all the age groups. The researcher therefore chose four classes at the school that fulfilled the age requirements, between the years of junior two and standard three, giving an age range of six to eight years at the start of the project.

The age of the children for the Small Group Study was set as at 1st September 1991 so that every child in the project would have one birthday during the

project which ended in August 1992. By doing this, all the six year olds were seven by the end of the project, all seven year olds were eight and all eight year olds were nine. No screening of the children was allowed and therefore a five year old was included in the sample, because she was a member of the a class originally involved.

Female children were chosen for the Small Group Study so as to limit the size of the sample and to rationalise the toy choices. Male and female children have different choices in toys and it was thought that this would just complicate the project unnecessarily as one would have to select a toy with which both groups could work. It was felt the female children were, on average, more likely to be able to cope with all the different techniques that were to be tested especially at the lower age group. As the children could not be screened, it was important that as many as possible be able to perform the tasks or a lot of time would have been wasted collecting worthless data. These assumptions were supported by the information collected in the Group Introduction where the male children did not complete the questionnaire as well as the female children and the toy choices were clearly affected by gender. Using both genders would have complicated the analysis unnecessarily.

The school chosen had a roll that was predominately made up of European, middle and lower socioeconomic, children. It was not possible to organise a representative sample of the ethnic and socioeconomic mix found in New Zealand. While cultural and social differences are important, taking account of these differences for this preliminary study appeared an unnecessary complication. If the techniques were successful they could be tested later with children from other backgrounds. Some of the children in the project were of various ethnic origins but the numbers were so small it was not possible to say if they had an effect on the results. Care would need to be taken in transferring the results of this research for use with children of other cultures.

4.2.3 *Toy Choices by Children*

While the project did produce some results on toy preferences it should be remembered that toys can be seasonal, some are more preferred in summer than in winter and vice versa. Toy preference is also governed by what is in fashion. While some toys are "long stayers" in the market, others have a very short life cycle and still others have life cycles that are cyclic in nature. Attempts were made to avoid very "faddy" toys but there was still some evidence that a particular toy was having a "good week" at the time of the Group Introduction. These factors will have affected the toy preferences, much as they do with products for adults.

4.2.4 *Learning Curve for Children*

Children learn very fast. It was very obvious that by the end of the Small Group Study, the female children had learnt a lot about the techniques they were using and they had become "consumer research experts" over the three month period. It would not been sensible to test the prototype product on these children to gauge its ultimate success in the market place. To illustrate this point, one of the classes had some money to buy some new games for their class. They decided to do a survey in class to choose the new games they would buy and were most keen to discuss which ones they were going to buy and why. This heightened awareness of the attributes of the products and of themselves as consumers was most interesting.

4.2.5 *Obtaining Caregivers' Consent*

Informed consent had to be obtained from the caregivers of all the female children in the project. This was done by sending home a letter and consent form (Appendix 4.1) with each child to be returned to school once completed. Before the letters were handed out the project was explained to each class and any questions answered. The letter explained the project to the caregivers and gave them a contact telephone number to enable them to discuss any questions with the researcher. Two caregivers contacted the researcher for a discussion. It had been decided that for any forms not returned within a

fortnight the caregiver would be contacted in order to increase the return rate of the forms. This was not necessary as all the forms were returned with 100% consent for participation in the project. The letter sent home was personalised, mentioning each child by name, throughout the letter. This had an interesting effect on the children who were delighted to have their names included in a letter from Massey University, on official Massey University letterhead. Many of the children had read the letter and talked about parts of it during the project.

4.3 Techniques to Encourage Participation from Children

When obtaining information from adult consumers many techniques have proved to be valuable. The purpose of this research was to test out some of these techniques to see if they were suitable for use with children in small groups. While for the most part the consumer research techniques that were used were the same as those used with adults, some adaptations were made to the techniques and to the environment, making it more conducive to obtaining accurate information from the children about the products. Some general principles were applied to all the sessions and in modification of the techniques so that they were more appropriate to children of this age group.

4.3.1 Motivation and Reward

Motivation and reward were necessary to keep the children interested in the project because the practical component lasted for six months. It started in March 1992 with the Group Introduction and finished in August 1992. The second stage, Small Group Study, started in June 1992 to avoid interruption by the school holiday break in May. Immediately after the Group Introduction, all the children who participated were given a certificate (Appendix 4.2). It was important, for the second stage of the project, that the children remained motivated to continue the work so that recruitment of new children for the project was not required.

For the Small Group Study motivation was inherent in the project as the children were removed from the normal class situation to play with toys, a situation and an activity that was very appealing. Also, the only way they knew what they were going to do each time was to come and see. Some communication occurred between some members of the groups but it was not as prevalent as the researcher would have expected. It was also important that, wherever possible, the activities were made fun for the children.

A reward system was also used as motivation. The children had to attend four forty-five minute sessions over the three month period. Each child had their own certificate and each time they attended a session they received a sticker of their choice to place on the certificate (Appendix 4.3). The stickers were not awarded on the basis of performance, purely attendance. All the female children were very keen to have four stickers on their certificate so this encouraged them to attend each session. The children were praised as a group for good work and producing good results. This was done during the sessions and when the results were discussed at the start of each session. The children also liked to hear what other researchers at Massey University thought of the work they had completed. This made them feel very important and involved in the work.

The gifts given at the end of the research also became an unintentional source of motivation. Even though the gift was not mentioned by the researcher to the children they had read it in the letter to the caregiver and often brought it up in discussion. The gifts therefore became a source of motivation for the girls to stay in the study until the end. The party that was held at the end of the project was not used as motivation, but purely as a method of rewarding and thanking the children for their work.

4.3.2 *Written Material*

If consumers do not understand what is being asked, their answers are unlikely to make sense. This is especially a problem with young children who are just starting to master the written word. Care needed to be taken with the written material to make sure that any barriers to understanding were removed.

The wording on any written material to be used by the children was specifically kept simple. Even those children that were not competent readers needed to be able to understand the statements or questions that were read to them by other children or the researcher.

The material used a larger than normal font, at least fourteen point and often sixteen point and at least double spacing. Children find small fonts and line spaces harder to read. Some simple children's books were used as a guide for a suitable font size and line spacing.

The answer spaces in questionnaires were also made larger than normal, double or triple spacing. Children's handwriting is larger than adults and a larger gap between the lines was to facilitate their written expression by allowing them to write in their normal manner.

The number of pages in any document was also carefully considered as children tend to equate the number of pages with lots of work. They tend to lose interest and complain even if there is very little on each page. It was found better to produce five one page documents than one five page document. This constraint combined with the larger fonts, line spaces and answer spaces meant the number of statements or questions per document was strictly limited to the absolute essentials.

4.3.3 *Language*

Type of language was carefully considered. Wherever possible their own words were used in the written material and in the discussions. Where words had to be used that they might not have understood, a discussion was held before the activity to ensure that all were clear about what they meant. The children themselves were encouraged to explain the meaning, to the other children, so that the explanation was in their own words and the problem of understanding was not compounded by difficult words in the definition. Any tapes made of the children talking, were listened to carefully in order to pick up appropriate language.

4.3.4 *Making the Work Important*

During the sessions, it was necessary to ensure that the children understood the importance of the tasks they were undertaking as the work was not being evaluated by a teacher and given a quality assessment, such as a good star or an "excellent" or "very good" for correct answers. This was achieved in several ways. The task of explaining what was going to happen to the data at the end of each session and then giving them the results at the beginning of the next session showed them that the researcher was using their answers for something important and that other people were interested in what they were doing. During discussions with the female children in the Small Group Study, the concept of using the information to develop a new product was raised in each session so they could see how the work was being used. Many of the children had seen their caregivers fill out market research questionnaires, participate in focus groups or test products in the home, so this experience was drawn into the discussions. By the end of the Small Group Study they understood that the activities that they had been doing were going towards "inventing a new product".

For the Small Group Study, the children were put into permanent groups for the length of the project. This gave the children a sense of unity, and importance was attached to what group they were in. All the children wore

name badges that included their name and group letter. These badges, similar to those worn by adults at conferences, provided the correct sense of importance and identification with their group. This identification with their group made them want to perform well so their group did well.

The children were given choices during the session, whenever possible, about how things could be done. For example they were always asked whether they would like, either, to take turns at reading the material aloud or to "silent read". This gave a sense of their opinion being important. They were always given the choice of where they would sit, what colour cards they would have and what activity they would like to do first. All this created a team atmosphere to achieve a common goal and tried to break down the teacher/pupil feeling of the groups as much as possible.

Lastly the fact that the project was based at Massey University helped its importance status. Many of the children had parents, relations or friends that worked or studied at Massey University and they saw it as an important place.

4.3.5 *Making it Fun*

While the children needed to realise the importance of their contribution to the project so that they did not treat the project as a just a way to get out of class and play about, they also had to see the activities fun to do. Failure to do this would have meant a rapid loss of interest and motivation. The fun aspect was achieved by giving them time to play in some of the sessions, and also by turning into games, or special events, some of the activities they needed to complete. For example the sorting exercise used for screening the product attributes was turned into a posting game. Little "postboxes" were used so the children "posted" their sorted cards rather than the researcher just collecting the sorted cards or the completed answer sheets at the end. At times during the sessions the atmosphere was given a little "jazz up". For example, the presentation of a new set of concepts to look at and score was

accompanied by a lot of secrecy, drum rolls, cheering and the like before the unveiling.

4.3.6 *Use of Cards*

Children of this age should have mastered the technique of sorting items into order but cannot manage too many items at once especially on paper. They tend to have difficulty working out what items they have already written down. One way around this was to give them cards and plenty of space on the floor so they could sort them into order and then transfer that order to a form.

4.3.7 *Use of Familiar Things*

This project was carried out in the school environment and therefore it was appropriate to use things that were already familiar to the children. The sessions were held in a classroom with normal desks and chairs so the environment was one in which they felt comfortable. To remove the problem of creating a classroom situation, the room chosen was used normally by a special unit so it was not a classroom that any of these children associated with their normal class activities. This room was slightly different from the others in the school but not different enough to be intimidating. If anything it was more of a fun environment with many colourful posters on the walls and lots of toys around (Figure 4.1).

Familiar school techniques were used such as: one hand held in the air which is the signal for "stop what you are doing and be quiet"; and "sitting on the mat" which meant a quiet time either for a discussion or to get instruction or to hear about something. By using these techniques the female children felt comfortable because they knew what was going on and what was expected of them. In this familiar environment with familiar signals, the desired behaviour was achieved.



Figure 4.1: Classroom for Small Group Study

4.3.8 *Timing*

For the Group Introduction the timing of the sessions was ideal - nine to ten in the morning, which is the first period of the day for the children. Unfortunately, for the Small Group Study, it was not feasible to remove the female children from class at this time. For obvious reasons the morning is a very valuable time from a teaching and learning point of view and it would have been disruptive to remove the children at this time when they are learning core subjects. The Small Group Study sessions were held between two to three in the afternoon, which is the last period of the day. In order to minimise the effects of the day of the week or the previous activities of a particular day, the days were randomised for each group so that one group did not always come on the same day of the week (Appendix 4.4). That meant Group A did not always come on a Friday afternoon when they were all tired from a week at school or on one particular day when they had always a sports period or quiet reading just before.

The amount of time to be spent on each session needed to be considered in the planning. Too many activities would have made the sessions too long for the children. The Group Introduction sessions took an hour to complete. During this time they spent only twenty minutes working on the actual questionnaire. The Small Group Study sessions took no more than fifty minutes with the children spending a maximum of twenty minutes on each activity.

4.3.9 *Group Dynamics*

An attempt was made to try and control some of the problems that occur when children are put into a group situation. For the Small Group Study the groups were set up in the following way. The children were divided into three age groups: six years olds (included the five year old), seven year olds and eight year olds. The 15 six year olds were split into two groups (A and B). The 14 seven year olds in the next two groups (C and D) and the 14 eight year olds into the last two groups (E and F). This meant that the children had

a better chance of being at the same level of competence and speed in terms of writing, reading, drawing and speaking which was important to get the best results from all the children.

The children all went to one school but tended to only really have a relationship with those in their own classes. A compromise was reached on the stranger/friend debate, as the groups contained children from more than one class, therefore they knew some of the children but not all. In this way no child felt alone but they also had to interact with children they did not normally see day to day. This was to try and prevent peer pressure to give the same answers.

As has already been stated, only female children were chosen for the Small Group Study. If male children had been included there would have been too many children, as the number of groups would double to at least twelve and therefore the length time of the project would have been doubled. This is because the males and females would have had to be kept in separate groups to stop disruption of the group dynamics as children of this age tended to be "anti" the opposite sex.

4.4 Consumer Research Techniques and Data Analysis

When considering the type of data analysis to be used, a very brief examination of the literature was undertaken in the area of analysis of parametric and nonparametric data collected from consumers. Parametric data gives a large range of analysis methods including, means, standard deviations and analysis of variance to determine significance, while it was not so clear what the appropriate methods for the analysis of the nonparametric data was for this particular project.

4.4.1 *Single Choice Preference and Preference Ranking*

The preference for toys were studied by two methods, firstly the children were asked to choose the toy they liked best and secondly they were asked to choose five toys and then rank them from the one they liked the best to the one they liked the least. The single choice was analysed by using the number or percentage of children who chose each toy and then the toys were ranked according to the number of children choosing the toy. (See Section 5.4.2)

Product concepts were treated in the same manner (See Section 9.6.2)

The choice of the five toys were firstly, again, analysed by taking the number or percentage of children choosing the toy and ranking the toys popularity from the highest number of selection to the lowest. Then the ranked preference data was scored from 1 = least preferred to 5 = most preferred, and the mean rank scores determined by dividing the total scores by the number of children. Parametric statistics, using Analysis of Variance on Stats-Packets Statistical Analysis Package were used to determine the most highly preferred toys.

There are other techniques used for analysing ranks, for example, Friedman test (Meilgaard et al., 1991), Kruskal-Wallis and Kramer tests (O'Mahony, 1982), transforming the ranked data into an interval scale, for example, Thurstone Case V (Green et al., 1988) but they were not suitable because the children were selecting five different toys and then ranking them. The toys were very different and as Amerine and Pangborne (1965) stated there is a strong relationship of the ranking to an interval scale in this instance.

The basic reason that this method was chosen was that both the children, caregivers and teachers understood means or averages as they often call them. (See Sections 5.4.3, 8.3 and 9.6.1)

4.4.2 Focus Groups

The Focus group technique was as used by Fraley (1987); Greenbaum (1988); Driggs and Mihm (1990); and Marney (1991) and is described in Section 6.4. The children were in groups of no more than eight with children of their own age. They sat on the floor and were asked some open-ended questions on the topic by the researcher where they were allowed to use the toys in the room to illustrate the answers. All the sessions were taped for information retrieval at the later date.

4.4.3 Projective Techniques

The projective techniques were adapted from Gordon and Langmaid (1988) and are described in Section 6.5. The children were given two pieces of paper along with writing and drawing equipment for this session. Using "story completion" they were first asked to write a letter to a friend describing a doll they wanted and then to draw a picture of the doll.

4.4.4 Hedonic Card Sorting

Product attributes were divided into two piles by the children - a "like" pile and a "dislike" pile. The "like" pile was divided into three grades of liking - "like the best", "like okay" and "like a little" or "kind of like". The percentage of children liking or disliking each attribute was determined and the significant difference between the attributes was determined by a Chi square test as this was category data. (See Section 7.3.1)

4.4.5 Hedonic Scaling

Two five point scales were used, one a Smiley Face Scale and one a Verbal Scale with terms that the children used - really gross, gross, okay, choice and really choice. The scales were scored from 1 to 5 and the means, standard deviations and significant differences between children and between toys were determined using Analysis of Variance in the Stats-Packets Statistical Analysis

Package as these were assumed to be true linear scales. There was a tendency for the children to score at the positive end of the scale but this was ignored in the analysis (See Section 7.3.2).

4.4.6 *Conjoint Analysis*

A Conjoint Analysis computer programme called "Conjoint Designer" was used to develop nine product concepts and two holdout concepts. These were then presented on cards to the children, who sorted them into ranked order from the one they liked best to the one they liked least. The Conjoint Analysis Programme used this ranked data to determine the preferred level of each attribute. (See Sections 8.4 and 8.6)

4.4.7 *Multidimensional Scaling*

Multidimensional Scaling was as used by Bahn (1986) and is described in Section 9.3. The children rating the similarity of two written concepts along with four commercial products using a seven point numerical scale. The mean similarity of each product or product/concept pair was used to provide a data matrix for analysis by the KYST-PC computer programme which then produced a spatial diagram.

4.5 Project Stages

This project was in five stages, Figure 4.1. The Group Introduction was conducted with class groups of approximately twenty five children. A total of ninety one children were involved, 41 females and 50 males. For the next four stages (Small Group Study) the 43 (2 were absent on the day of the Group Introduction) female children were divided into groups of no more than eight and worked on a number of different techniques for idea generation, idea screening, product concept development and product concept testing over a period of twelve weeks.

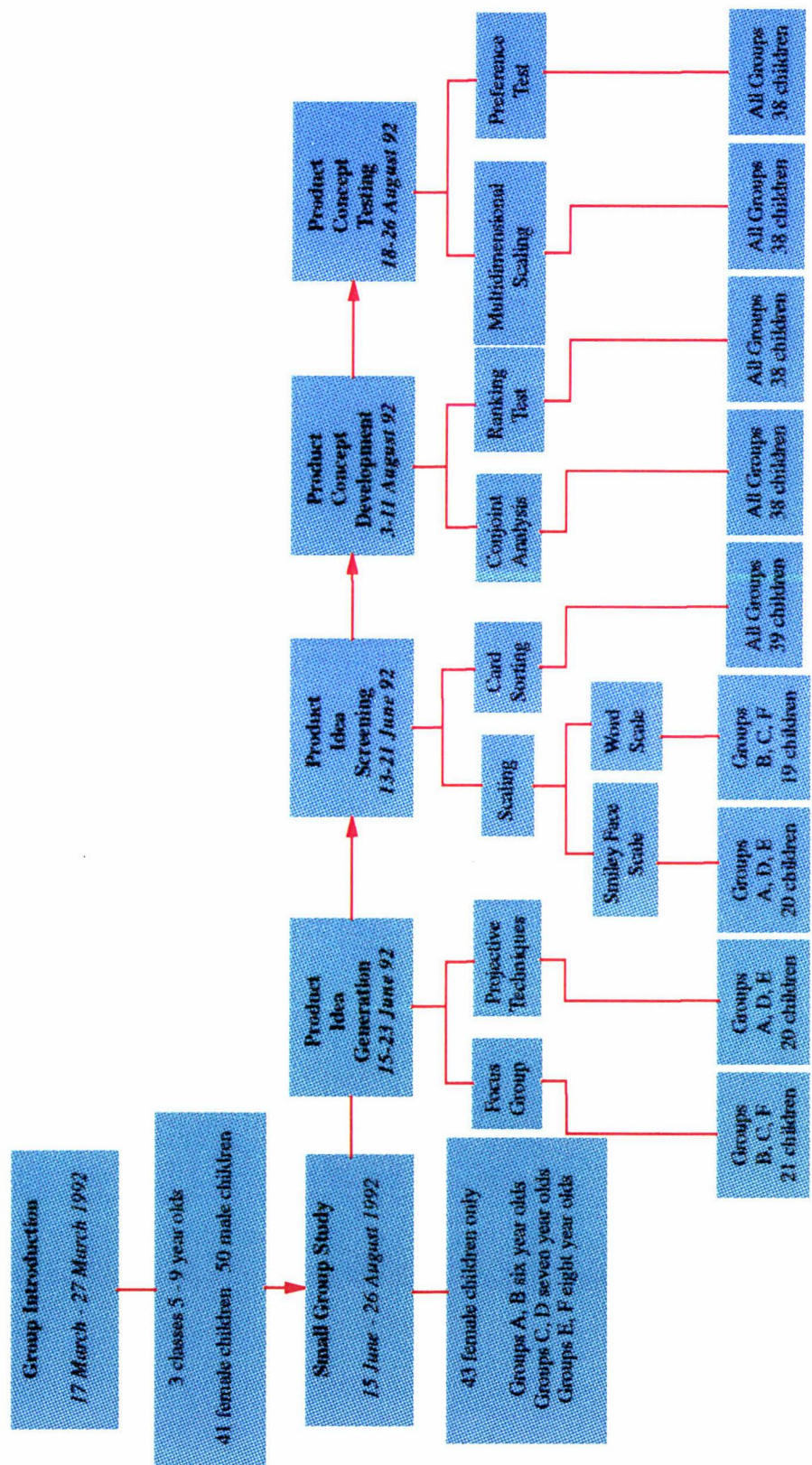


Figure 4.2: Outline of Project Stages

4.5.1 Group Introduction

A Group Introduction is a good idea as a preliminary for any consumer work. In the case of adult consumers this may be a focus group before a series of individual in-depth interviews. As the project involved children, a group introduction was vital as they were unlikely to have had any previous experience with this type of activity. To meet the ethical requirements it was important that the children were able to give some sort of informed consent. By starting the project with a group situation, under the observation of a teacher in a class room, it allowed the children to experience the activity and therefore enabled them to make an informed decision about any further participation they wanted to have with the project.

4.5.2 Product Idea Generation

Consumers are used for idea generation, although the degree of success in this activity depends on the expectation of the researcher involved. It would be fair to say that, unless consumers are screened for creative ability, the ideas tend to be user modifications to products, rather than, completely new ideas in the product category under discussion. Children are supposed to be less constrained in terms of the practicalities of cost and possibility of manufacture and therefore should be more creative in terms of ideas for new products. The children in this project participated in idea generation either as part of a focus group or by completing two simple projective techniques.

4.5.3 Product Idea Screening

Criteria for screening product ideas should include a number of areas such as: product features, possible production methods, costs, originality of the idea and consumer acceptability. The use of the consumer for product screening has obvious advantages, when success for a new product will ultimately be measured by market acceptability and product sales. As this was purely a study of consumer acceptability, only consumer input was used but this by no means suggests that the consumer input is the most important criteria in the screening of product ideas. The children in this study screened the ideas

they generated in the previous sessions using two methods. Questionnaires containing Word and Smiley Face Scales were used to screen complete ideas for new products, and a sorting technique was used to screen product attributes.

4.5.4 Product Concept Development

Once a set of products and/or attributes for products has been screened it is possible to develop a new product concept from them. Screening gives those product attributes or product ideas that are most important or most preferred by the consumers and also the most suitable for the company to manufacture. Consumer input is required at the product concept development stage to enable the best possible combination of attributes to be included in the new product design. The technique of conjoint analysis was used to develop new product concepts for testing. A ranking questionnaire was also used to determine the most preferred toys in the product category on the market in order that the new concept could be tested against them in the final stage.

4.5.5 Product Concept Testing

Concept testing is the last step in this initial stage of product development. At this point a company's decision for further work on the project must take into consideration the rapid increase in capital expenditure that will be required to continue. Including consumer input at this point is vital. For the product concept testing, multidimensional scaling was used to position the new concepts amongst present products on the market and a short preference questionnaire was used to choose the most preferred product concept.

Chapter 5

Group Introduction to Children

5.1 Introduction

The main function of the Group Introduction was for the female children to experience the activity so they were able to make an informed choice on further participation. The Group Introduction also looked at the toy preferences of the children, both male and female aged five to nine years, to determine what toy or toys to use for the rest of the project. The male children would not be used in the second part of the project but the data could be used in later studies. As this is a large area it was necessary to involve the children in choosing an appropriate toy or toys. This chapter covers the selection process that determined what toys were included in the study. Initially the toys presented to the children were chosen by the researcher. The Group Introduction was also being evaluated as a technique, therefore an evaluation of working with classroom groups of children for the collection of consumer information was conducted.

5.2 Toy Selection for the Group Introduction

For the Group Introduction the choice of toys was extremely difficult. They had to appeal to male and female children between the ages of six and nine, not an easy task as many of the toys had quite restricted age group interest or were very gender specific. An attempt was made to choose a range of toys based on the best selling toys identified by Sutton-Smith, 1986 (see Table 1.1).

Table 5.1: Toys Chosen for the Group Introduction

Games:	Ludo Scattergories
Art/Craft:	Paint by Numbers Crayons and paints set Fimo modelling clay
Skill Toys:	Cube puzzle Water game
Dolls:	Sindy doll* Ninja turtle*
Outside toys:	Water slide Paddle ball
Construction toy:	Lego
Activity Toy:	Magic set

Note: *These were seen as gender specific and so were put together as one toy choice rather than two

Thirteen toys (Table 5.1) were shown to the children in the Group Introduction. The criteria for toy selection was simple. They had to be suitable for the age group in the study, five to nine years, non gender specific and within a price range of fifteen to forty New Zealand dollars. Care was taken to choose products that represented a wide range of toy types while remaining relatively unisex in nature. While toys that were obviously aimed at either boys or girls were not included, the doll category was the obvious exception to this. A "boy type doll" (Ninja Turtle) and a "girl type doll" (Sindy) were combined in one choice and they were told to name the doll they had chosen. Care was taken to choose toys that had been on the market for a long time so as to avoid fads. For example, Trolls were extremely popular but they were not included in the study as they were a "fad" product at the time. No toys were included that might have been unacceptable to any of the caregivers or teachers, for example war toys.

It was decided to choose a wide cross section of toys, within the constraints already mentioned. There was also an attempt to get toys with which the

children would be familiar so that the answers they gave were meaningful.

5.3 Group Introduction Techniques

5.3.1 *Overall Organisation*

The complete cohort in each class was involved except where specific children were absent for the day. No screening of the children occurred before the start of the Group Introduction. The class groups contained approximately twenty five children giving a total of ninety one children involved. The numbers of males and females, and different age groups of the complete sample are shown in Appendix 5.1.

Each class activity was held between 9 am and 10 am in the morning. This is the first period of the school day and was suggested by the teachers as being the time of most alertness and concentration by the children. The researcher was introduced by the class teacher who stayed in the room while the activity progressed. In the younger classes, the teacher helped the researcher to ensure all the children could complete the questionnaire.

The toys, still in their boxes as they would be seen in a shop, were placed at the front of the class room (Figure 5.1). Each toy had a large label attached, (Appendix 5.2) giving the toy's name and a number so the children could use the numbers to identify the toys on the questionnaire.



Ludo, Water Slide, Magic Set, Crayola Caddy, Scattergories, Paint-by-Numbers Set, Sindy Doll, Ninja Turtle, Water Game, Cube Puzzle, Fimo Modelling Clay, Lego, Paddle Ball

Figure 5.1: Toys used in Group Introduction

5.3.2 Defreezing

The children were told that the project was being carried out by Massey University and the researcher wanted to know what the children thought of toys. For this session they were told that the researcher needed to know which toys children liked. The researcher and the children discussed why children were the best people to talk about toys. This encouraged the children to say that they were the experts and knew more about toys than anyone else. The researcher then went on to explain the difference between a test and a questionnaire. *"In a test there were right or wrong answers, in a questionnaire the only type of wrong answers were ones that people had copied from someone else's paper"*. This was to encourage them to do their own work. This preliminary introduction gave the project a sense of importance so the children had a feeling that their contribution was important. The discussion was held by the researcher with the children seated as a group on the floor in front of the toys.

The last part of this session was a discussion with the children on the toys at the front of the class. The children had previous knowledge about some of the toys, but each toy was taken in turn and discussed with the children so they knew at least a little about each one. This was done to help the children make educated choices on toy preference. The children were encouraged to give descriptions of the toys they knew, rather than the researcher giving a description, so the other children received the descriptions in appropriate language. This involved the children and reinforced the idea that their ideas and opinions mattered and they were indeed the experts.

5.3.3 Activity for the Group Introduction

Each child was then given a questionnaire (Appendix 5.3) to complete on the toys. In the older classes, the children then returned to their desk and completed the questionnaire individually. This took about half an hour and each child handed the questionnaire to the researcher by running to the front of the class when they had finished. This added a game aspect to the process.

In the younger classes, the children also returned to their desks, but completed one question at a time as a class group. They took turns to read the questions out loud to the rest of the class and then the children wrote their own answers individually. Some of the children required help in writing their answers and this was carried out by the researcher and the teacher of the class. All answers were recorded verbatim, no help was given to the children to obtain correct answers in the preference questions even if the numbers they stated were obviously wrong.

5.3.4 Session Completion

At the end of each session each member of the class was presented with a certificate, (Appendix 4.2) along with appropriate clapping from the class and congratulations from the teacher. This was to reward their participation in the project. The class was told that the researcher would come back with the results and the female children were asked to think about whether they would like to participate further in the project if the activities were similar.

5.3.5 Visit to Discuss Toy Choices

After all the classes had been completed the researcher visited each class with the results of the questionnaires. The results were presented to the children firstly, for their class alone and then for all the classes as a whole. The children then discussed the ranking of the toys with the researcher commenting on how valid they thought they were in terms of what they had expected the answers to be. For example, when the data showed that the six year old females preferred the "Sindy doll" as first choice, the classes all agreed that that would be so. The younger females verified they had chosen the doll and the older children believed that younger females still played with them and therefore would have been likely to choose them. They were extremely keen to comment on how the results compared to the toys they had chosen. They could remember quite clearly the toy they had chosen as their favourite even after a two week break.

Care was taken to ensure that all questions were answered in these sessions and the children were involved fully in the discussion. This stage was included to meet ethical guideline of "reporting back information" and was taken seriously by the researcher and the children. The session took about thirty minutes for each class.

Once the results had been presented, the female children were asked if they wanted to continue with the rest of the project. A personalised letter (Appendix 4.1) was given to each female child to take home to caregivers to obtain consent. It was carefully explained to the children involved that they were under no obligation to participate. They should discuss the project with their caregivers and then decide.

5.4 Toy Selection by the Children

5.4.1 *Ability to Complete the Questionnaire*

A questionnaire (Appendix 5.3) was completed by forty-one females and fifty males between the ages of five and nine from junior two to standard three. The children were asked to complete six activities related to the toys as shown in Table 5.2.

Table 5.2: Group Introduction Activities

Pick five toys you would like from the toys shown.
Pick one toy from the toys shown.
State why you chose the one toy.
Put the five toys already chosen in order of preference.
Draw a picture of your favourite toy from home.
State why you like that toy.

Of the ninety-one children, five females and twenty-one males could not complete the tasks required (Table 5.3).

Table 5.3: Analysis of Questionnaire Success by Gender and Age Group

		Age in Years					Total
		5	6	7	8	9	
Female	Unsuccessful	1	3	1	0	0	5
	Successful	0	11	12	13	0	36
Male	Unsuccessful	1	11	4	5	0	21
	Successful	0	10	10	7	2	29
Total		2	35	27	25	2	91

This left a sample of thirty six females and twenty nine males for analysis. For the analysis the eight and nine year olds were combined to give three age groups "six", "seven" and "eight" years. The data from the five year olds were removed from the sample because they had been unable to complete the questionnaire task satisfactorily.

5.4.2 *First Choice Toy Preference*

The results for choice of one toy out of the twelve are shown in Table 5.4.

Table 5.4: **Choice of One Toy by Female and Male Children**

Toys	Female	Male	Total Children
Sindy/Turtle	11	0	11
Water Slide	6	4	10
Magic Set	6	4	10
Modelling Clay	6	3	9
Crayola	3	3	6
Cube Puzzle	2	4	6
Scattergories	2	1	3
Lego	0	5	5
Water Game	0	4	4
Paddle Ball	0	1	1
Ludo	0	0	0
Paint-by-Numbers	0	0	0
TOTAL Children	36	29	65

A clear lead in first preference was given to the doll as far as the females were concerned. They only spread their first choice over seven of the toys presented. The males in the study were more even in their choice with several toys of equal preference: "Lego", "Water slide", "Magic set", "Cube puzzle" and the "Water game". "Lego" and the "Water game" were not chosen by any of the females as their first choice and the dolls were not chosen by any of the males. "Ludo" and "Paint-by-numbers" were not chosen by any of the children.

For the different age groups, the choices are shown in Table 5.5. As expected the doll was more heavily supported by the six year olds who were still most involved in playing with dolls on a regular basis. The "Modelling clay" and the "Magic set" were the most popular with the seven and eight year old females respectively. The males again gave an even spread with no product being preferred over another. These results supported the assumption that

it is difficult to chose one product that will satisfy all age groups and both genders.

Table 5.5: Choice of One Toy by Age Group

Toys	Female			Male		
	Six	Seven	Eight	Six	Seven	Eight
Sindy/Turtle	7	2	2	0	0	0
Modelling Clay	1	4	1	1	2	0
Water Slide	3	1	2	3	0	1
Magic Set	0	2	4	0	3	1
Crayola	0	1	2	1	0	2
Scattergories	0	2	0	0	0	1
Cube Puzzle	0	0	2	0	2	2
Lego	0	0	0	1	2	2
Water Game	0	0	0	4	0	0
Paddle Ball	0	0	0	0	1	0
Ludo	0	0	0	0	0	0
Paint-by-Numbers	0	0	0	0	0	0
TOTAL	11	12	13	10	10	9

The reasons given for choice of the toys made interesting reading. A complete list of the reasons taken verbatim, spelling and all, from the questionnaires can be found in Appendix 5.4.

For the most popular toys chosen by the female children, the following reasons were given. The "Sindy doll" scored highly because she was pretty, nice and looked "hot". She was fun to play with. The word "like" appeared often. One child wrote "because her Sindy was lost and broken" and another girl liked the way the clothes changed colour. They also liked playing with dolls.

The "Modelling clay" was chosen because: they liked to play with clay, you can wear things you have made, it's fun, and you can keep what you make. The "Water slide" scored with the females because: they liked water, they do not have one, it is fun and cool, they like swimming, and they like to get wet.

Lastly the "Magic set" was seen as fun. They liked to watch magic tricks and they would like to "have a go". They would like to put on a magic show. They can play with their brothers and sisters. Magic makes people smile. You can trick your friends. Lots of tricks to do! This product was seen as an activity you do with others which made it different from the others that were popular.

5.4.3 Choice of Five Toys

When asked to choose five of the toys, the pattern was very similar to the single preference. Table 5.6 shows that the numbers of children choosing the toys for the toys remained more or less in the same order. For the female children the "Sindy doll" and "Modelling clay" were preferred by the highest number. The male children's choices were not as clear cut but the "Magic set", "Water slide", "Lego" and the "Water game" appeared to be the most popular.

Table 5.6: Choice of Five Toys by Female and Male Children

Toys	Female	Toys	Male
	No %		No %
Modelling Clay	26(72)	Magic Set	21(72)
Sindy/Turtle	25(69)	Water Slide	20(69)
Water Slide	20(56)	Lego	18(62)
Magic Set	22(61)	Water Game	16(55)
Crayola	22(61)	Modelling Clay	15(52)
Scattergories	17(47)	Cube Puzzle	14(48)
Paint-by-Numbers	15(42)	Crayola	13(45)
Cube Puzzle	12(33)	Sindy/Turtle	10(34)
Water Game	9(25)	Scattergories	7(24)
Lego	5(14)	Paddle Ball	5(17)
Ludo	4(11)	Ludo	3(10)
Paddle Ball	3(8)	Paint-by-Numbers	3(10)
Total Children	36(100)		29(100)
Total Choices	180		145

Table 5.7 gives the choice by age group and shows a similar pattern to the single preference data shown in Table 5.5. The data from the male children was fairly evenly spread over eight of the toy types. The data from the female children was interesting. All the six year olds chose the doll as one of their five choices and this trend decreased with age with a corresponding increase in the numbers that chose the "Modelling clay". However the numbers are small and not much more than general observations can be made. The same toys remained more popular. The "Sindy doll", "Modelling clay", "Magic set" and "Crayola" for the female children and the "Magic set", "Water slide" and "Lego" for the male children.

Table 5.7: Choice of Five Toys Age Group

Toys	Female			Male		
	Six	Seven	Eight	Six	Seven	Eight
Sindy/Turtle	11	8	6	6	2	2
Modelling Clay	7	9	10	6	6	3
Water Slide	8	6	6	7	6	7
Magic Set	5	9	8	6	8	7
Crayola	7	6	9	3	5	5
Scattergories	3	8	6	2	4	1
Cube Puzzle	3	3	6	4	5	5
Lego	3	1	1	7	6	5
Water Game	2	3	4	5	4	7
Paddle Ball	0	1	2	2	1	2
Ludo	1	1	2	2	1	0
Paint-by-Numbers	5	5	5	0	2	1
Total Children	11	12	13	10	10	9
Total Choices	55	60	65	50	50	45

The children then put the five toys they had chosen in order of preference. These were ranked from five to one (most preferred to least preferred). The mean preference scores of this analysis are shown in Table 5.8.

Table 5.8: Preference Scores for Toys by Female and Male Children

Toys	Female Mean Score*	Male Mean Score**
Sindy/Turtle	2.5 (2.0)a	1.1 (1.7)bd
Modelling Clay	2.4 (1.9)ab	1.3 (1.7)bc
Magic Set	1.9 (2.0)ac	2.0 (1.7)ab
Crayola	1.7 (1.7)bcd	1.1 (1.6)bd
Water Slide	1.5 (1.8)cd	2.3 (2.0)a
Paint-by-Numbers	1.4 (1.8)cd	0.3 (1.0)de
Scattergories	1.3 (1.6)cd	0.8 (1.5)cde
Cube Puzzle	1.0 (1.7)de	1.8 (2.0)ab
Water Game	0.5 (1.0)ef	1.5 (1.8)abc
Ludo	0.3 (1.1)ef	0.1 (0.3)e
Lego	0.3 (0.9)ef	2.3 (2.1)a
Paddle Ball	0.2 (0.6)f	0.3 (0.9)de

- Note:
- (1) The five most preferred products
 1 = least preferred 5 = most preferred
 - (2) The numbers in parentheses are standard deviations
 - (3) * total score divided by 36 female children
 - (4) ** total score divided by 29 male children
 - (5) Mean scores within the column followed by a different
 letter are significantly different at $p<0.05$

The preference did not provide a clear leader in terms of preference for either the female or male children. The "Sindy doll", "Modelling clay" and the "Magic set" were the top three for the female children, with the "Sindy doll" and the "Modelling clay" being significantly different from the rest of the toys. While the "Lego" and the "Water slide" were the most preferred with the male children, they were not significantly different from the "Magic set", "Cube puzzle" and the "Water game". The preference data can be found in Appendix 5.5(a) and the Analysis of Variance carried out on Stats-Packets Statistical Analysis Package is in Appendix 5.5(b).

Table 5.9: Preference Scores for Toys by Age Group

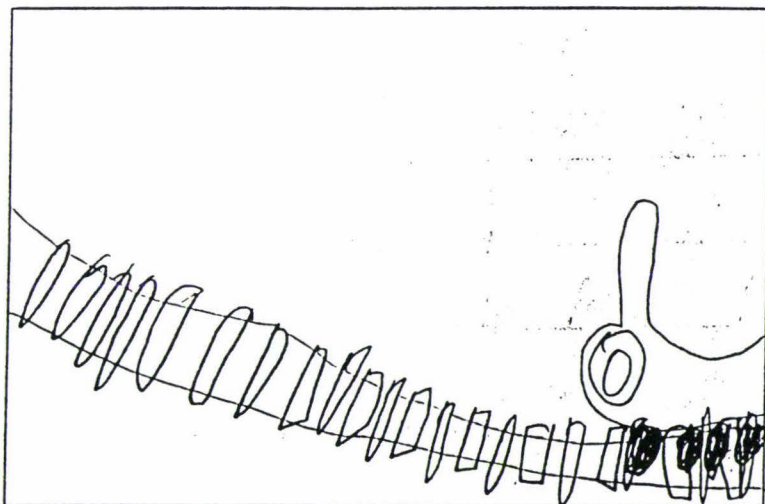
Toys	Female			Male		
	Six	Seven	Eight	Six	Seven	Eight
Sindy/Turtle	4.2	1.9	1.5	1.7	0.1	0.0
Modelling Clay	1.5	3.1	2.6	1.5	1.9	0.3
Water Slide	2.2	1.3	1.2	2.8	1.8	2.3
Magic Set	1.1	2.1	2.5	1.1	2.7	2.1
Crayola	2.0	1.3	1.8	0.5	1.3	1.7
Scattergories	0.6	2.3	1.0	0.6	1.1	0.6
Cube Puzzle	0.6	0.8	1.5	1.5	1.9	0.3
Lego	0.4	0.3	0.2	2.7	2.2	2.1
Water Game	0.5	0.5	0.5	2.1	0.7	1.9
Paddle Ball	0.0	0.3	0.2	0.5	0.1	0.4
Ludo	0.2	0.1	0.7	0.2	0.1	0.0
Paint-by-Numbers	1.7	1.2	1.2	0.0	0.5	0.4

When the data split into age groups were examined, Table 5.9, the picture was not quite so clear. None of the products appeared to score significantly better than any of the others except the six year old females scored the "Sindy doll" at 4.2 compared with 2.2 for the next highest, the "Water slide" and the seven year old females scored the "Modelling clay" at 3.1 with the "Scattergories" at 2.3 the next highest.

5.4.4 *Favourite Toy At Home*

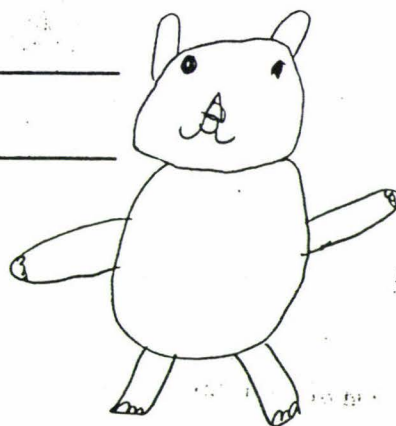
The children were asked to draw their favourite toy from home and say why they liked it. This was to test their ability to draw the object they wished to describe and also to see if a common theme of toy appeared that may have been overlooked by the researcher in the original toy selection. The female children of all ages showed a preference of dolls and soft toys with 23 of the 41 female children choosing these. The rest of the female children chose items such as art materials, a water slide, a piano, board games and roller skates. The choices of the male do not give one most preferred type of toy. They chose items such as Lego, cars, computer games, skates and skate boards, soft toys and sports equipment. A small selection of the drawings and answers

from each age group and gender is shown in Figures 5.2(a) to 5.2(c) and 5.3(a) to 5.3(c). A full list of reasons for liking their favourite product at home is in Appendix 5.4.



Why do you like this toy best?

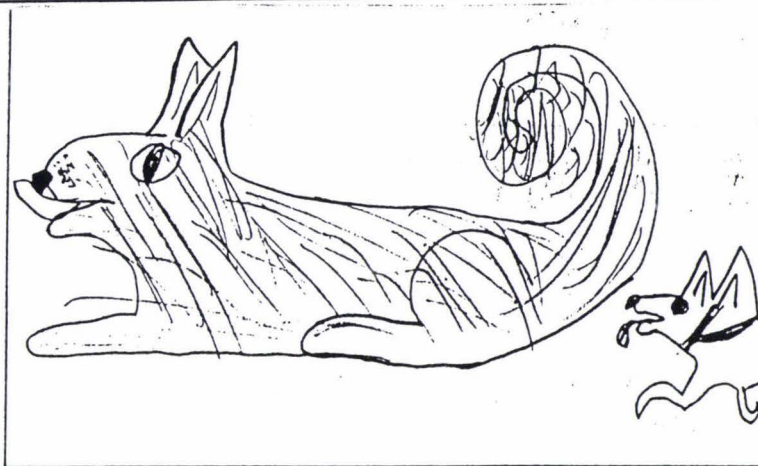
Because i think
it is fun.



Why do you like this toy best?

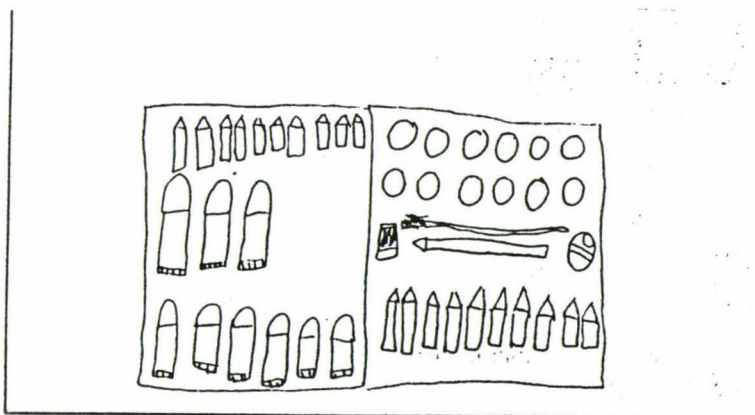
~~because~~ because because
It's fluffy

Figure 5.2(a): Six Year Old Females



Why do you like this toy best?

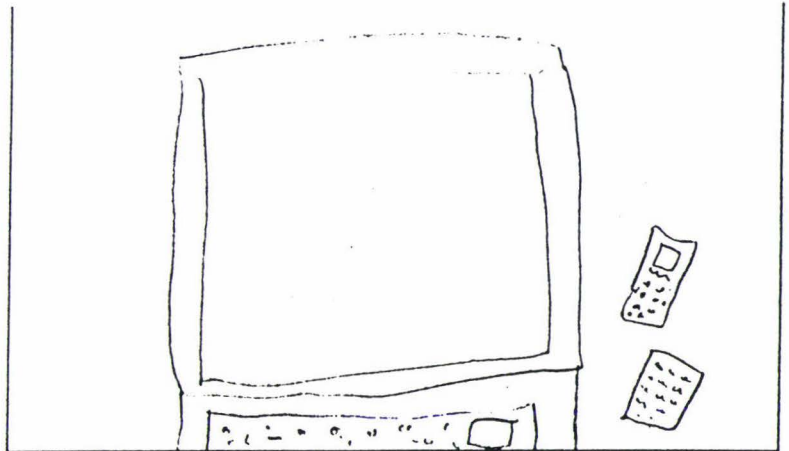
BECAUSE IT IS WARM
and fluffy and it
IS LIKE A TOY.



Why do you like this toy best?

because I use my art set
a lot and I like art

Figure 5.2(b): Seven Year Old Females



Why do you like this toy best?

because you can watch
it when you haven't got
anything to do I watch
it with my brother and
sister too I like watching
it too

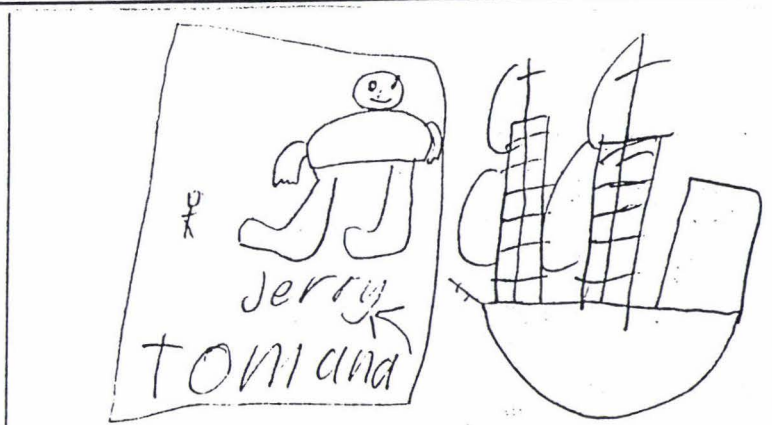


Why do you like this toy best?

Because two people can play with
it.

Figure 5.2(c): Eight Year Old Females

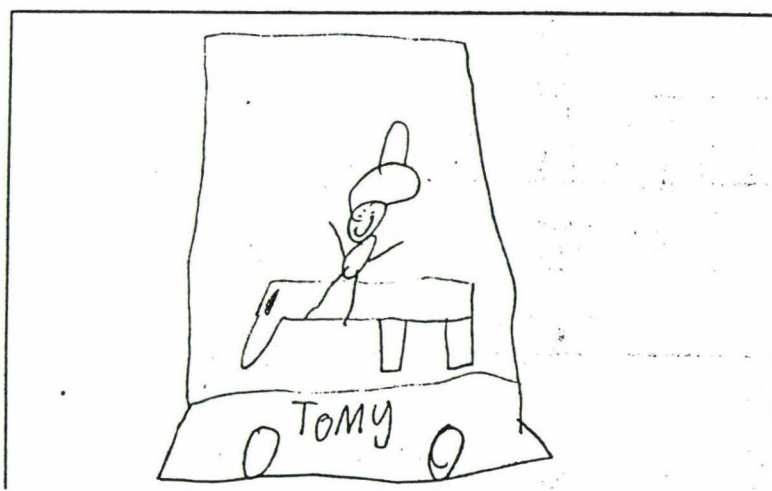
Figure 5.2: Drawings and Statements on "Favourite Toys at Home" by Female Children



Why do you like this toy best?

Because i can

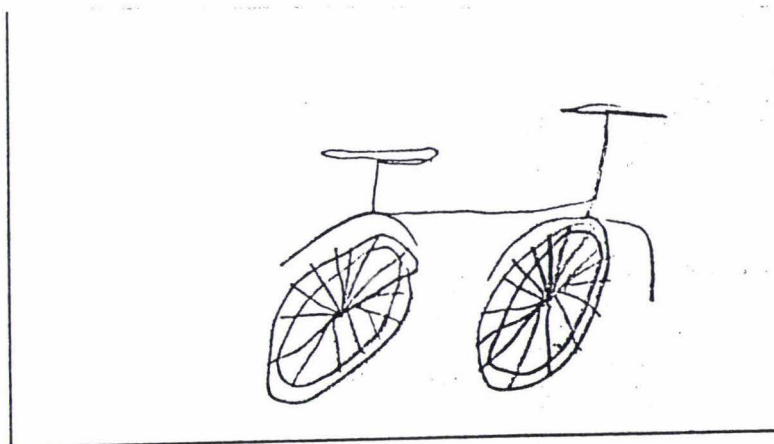
draw cool things
and BECAUSE
i like playing
with it.



Why do you like this toy best?

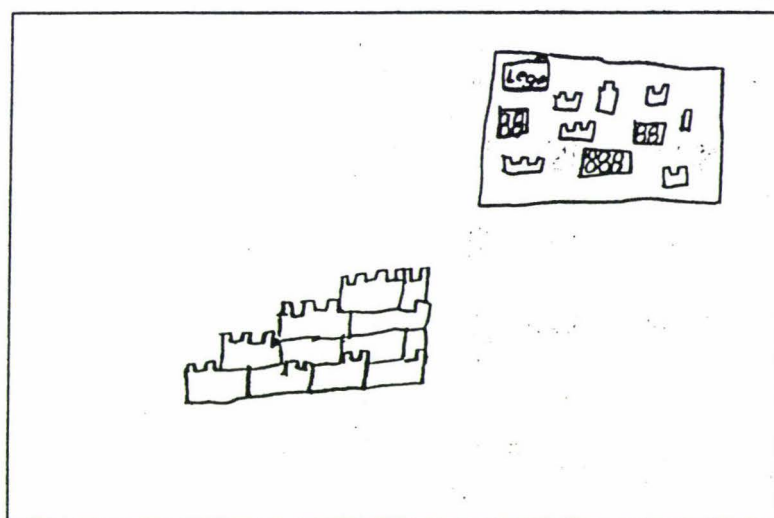
BECAUSE YOU CAN
PLAY all day
WITH IT.

Figure 5.3(a): Six Year Old Males



j. Why do you like this toy best?

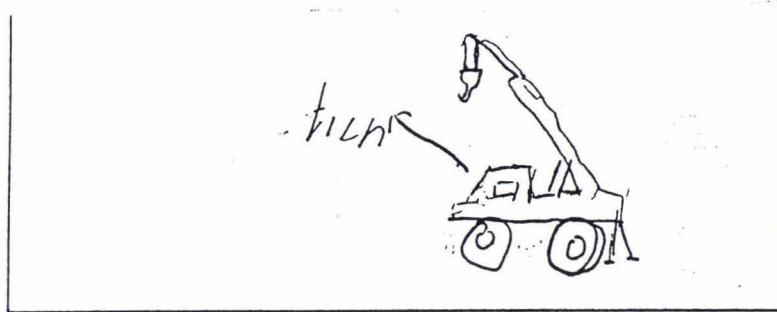
I Like this toy becuae
I Like doing Stunts.



i. Why do you like this toy best?

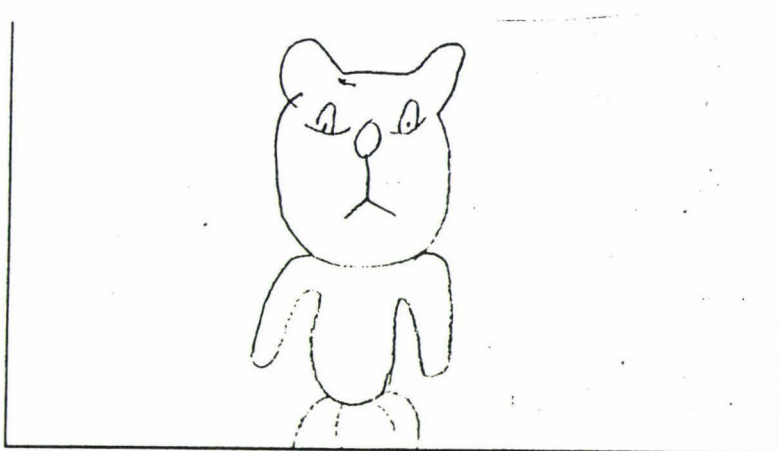
I like it Becese it is fun
to make ~~the~~ thing ~~and~~ there
there is ~~the~~

Figure 5.3(b): Seven Year Old Males



Why do you like this toy best?

because it is good for
the ^{brain} ~~base~~ and
you can be ^{proud} ~~pord~~
over what ~~you~~
have done.



Why do you like this toy best?

because I got it
made when I was one

Figure 5.3(c): Eight Year Old Males

Figure 5.3: Drawings and Statements on "Favourite Toys at Home" by Male Children

5.5 Evaluation of the Group Introduction Technique used with the Children

The Group Introduction successfully met the criteria of choosing toys for the rest of the study. The "Sindy doll" and the "Modelling clay" came out as the most preferred products by the females. The toys they liked at home did not give any strong indication that a product had been missed out, even though many different products appeared. The Group Introduction clearly, gave the female children a chance to experience the activity which helped with the discussion on later participation and stimulated interest in consumer products and questionnaires in the classes that lasted several weeks. It also gave the researcher an opportunity to show the teachers what the project was about and provided a basis for discussion on later visits. All this was important in terms of meeting ethical guidelines set for the project. Overall the teachers felt it was a good class activity, providing the children with a valuable learning experience. With the introduction of the new curriculum developments, especially in the technology area, an activity such as this provides children with a learning experience that will be valued by their teachers in their endeavours to meet the new requirements.

It is important to look at the skill with which the children completed the questionnaires. As can be seen from the data a number of the children's questionnaires had to be removed from the sample for analysis; five females and twenty-one males. As expected more younger children failed to complete the tasks required. In the female group the data from the five year old, 3 six year olds and 1 seven year old had to be deleted from the sample. None of the data from the eight year olds had to be deleted. In the male group the five year old, 11 of the six year olds, 4 of the seven year olds and 5 of the eight year olds failed to complete their tasks properly. Neither of the nine year olds had any difficulty. Individual's data was removed from the sample for several reasons. The most common reason was the failure to put the five

toys in order of preference correctly. As the preference data was most important a check was put in to make sure that the children understood the questions and were not just writing any number. The children had to pick five toys and then put them in order of preference. If the five toys in the first question and the five toys they put into order in the third question were not the same the questionnaire was removed. As another check the second question required them to pick their most favourite toy. If this did not match the first toy they chose when they put them in order of preference then the questionnaire was again removed from the sample. This was the major reason the questionnaires were removed from the sample. Some of the children also failed to complete all the tasks in the given time. It is significant that more males than females had to be removed from the sample but further detailed investigation was to determine the reason for this was beyond the scope of this project. The younger children wrote less as answers for the open questions and their drawings were more difficult to understand (Figures 5.2 and 5.3).

The rest of the children handled the questionnaire well and provided accurate consistent information on product preference. While some comparing of answers occurred, there did not appear to be a major copying problem once the importance of the work was described. The children tended to discuss what they had written, not what they should write. The complete process took about forty minutes per class. With the average class size of between twenty five and thirty children this provided a cost and time effective way of collecting data from children of this age.

None of the literature consulted, used a Group Introduction involving a complete classroom of children as a method of collecting product information from children so a comparison of this research with others was not possible. However the projective technique of picture drawing (Grabner, 1980 and

Gordon and Langmaid, 1988) and ranking (Schwenter 1978) and proved most successful methods in this research as well. Open-ended questions have been also used extensively (Lebender, 1978) and work well where the child has high interest and vocabulary, but can be stressful if the child is not sure what answer to give. In this research they were used to accompany the drawings or explain why they chose a particular product as their first choice. As the questions were on a topic they knew well and only a short and obvious answer was required the children were able to produce informative answers.

5.6 Discussion on the Toy Selection

The toys presented to the children were deemed to be unisex toys, however this proved to be a misnomer. While the toys appeared on the surface to be those that would be equally preferred by female and male children the small sample of data collected indicates otherwise. When asked to choose one toy no male children choose the doll and no female children chose the lego, water game or paddle ball but the doll was the most preferred by the female children and the lego and water game were popular among the male children.

The attempt to choose toys that were popular with the age range involved, that is six to nine year olds, was a little more successful but there were trends developing that would indicate that some of the toys did have a more limited age range than first imagined with the female children in particular.

A larger group of children would be required for any firm statements to be made on toy preference as although ninety-one children were surveyed only sixty-five children were left in the sample after the questionnaires were screened. This small number also caused difficulties in obtaining significant differences between the data.

5.7 Conclusion

On the whole, the children managed this activity well with the female children performing better than the male children. The class situation provided some advantages in being able to collect data from a reasonable number of children in a short space of time by one person. The poor performance of the male children would need to be examined further to try and reduce the unsuccessful rate of a little over 40%. Alterations to the technique may be required to achieve this.

Based on the results discussed in Section 5.4 the toys selected for the further stages of the study, with female children, were the "*Sindy doll*" and the "*Modelling clay*". Even though the doll was less popular with the older female children it was still felt they could relate to the product and be able to express themselves well whereas the younger children may have had difficulties with some of the other products that were not in their present sphere of interest.

Chapter 6

Product Idea Generation By Children

6.1 Introduction

The next stage of the project was the Small Group Study. This was conducted in four parts: product idea generation, product idea screening, product concept development and product concept testing. This research was carried out by the female children involved in the Group Introduction but instead of remaining in class groups they were divided into six groups of a maximum of eight children. The groups were chosen on age and this produced two groups each of six, seven and eight year olds.

The purpose of the first stage of the Small Group Study was to encourage the girls to generate ideas for a new doll product they would like to own. The results from the Group Introduction showed that the female children rated the Cindy doll and the Modelling clay as the most preferred toys so these two toys formed the starting point for this section of the work. Two Product Idea Generation methods were evaluated; focus group discussion and projective techniques (letter writing and picture drawing). Three of the groups, each containing seven girls participated in a focus group discussion and the other three groups, one of eight children and two of seven children, completed the projective techniques. One group from each of the three age groups; six, seven and eight years, completed each activity. The groups were allocated an activity by ballot.

6.2 Selection of Groups

As this was the first session of the Small Group Study the children had to be allocated a group that they would stay in for the rest of the project. The

selection of the group for each child was carried out in two parts. The children were divided according to their age on the 1st September 1992; six year olds, seven year olds and eight year olds. These children were then allocated, by ballot, into two groups for each age. The six year olds were allocated to groups A and B, the seven year olds were allocated to groups C and D and the eight year olds were allocated to groups E and F. Using this method of allocation the children did not remain in their class groups and therefore were less likely to be a complete group of friends.

6.3 Defreezing

The defreezing stage in this session was the most important defreezing stage of the project. This was the first time that each group had come together and it was vital to put them at ease as soon as possible. The children were given name tags with their name and group letter and these were worn at all the four sessions. They were told a little about the researcher and about the project in general and were asked a few questions about themselves. They were able to ask questions about the project and the rules of participation were carefully explained. These were: participation was voluntary and they could leave at any time; disruptive behaviour would result in being sent back to class; no copying of work was allowed because everyone's ideas were important to the project.

The children were then given toys to play with that would hopefully stimulate them to think of new toys in the same product categories. The toys they were given were: eight different Sindy dolls, three different baby dolls, and eight different products that could be moulded as shown in Figures 6.1(a) to 6.1(c). They played with the toys for about ten minutes observed by the researcher and recorded on audio tape. At the end of this time they felt more comfortable and were ready to start the activity.



(L to R) Wild Life Sindy, Twist and Twirl Sindy, Rock Star Sindy, Roller Blades Sindy, Tennis Sindy, Jet Away Sindy, Party Letters Sindy, Denim Dazzle Sindy.

Figure 6.1(a): Sindy Dolls



Figure 6.1(b): Baby Dolls



(L to R) Glow Blob, Silly Putty, Splat Balls, Play Doh Party Set, Guk, Play Doh, Splat Game, Splat Balls, Fimo Modelling Clay, Guk and Glow Blob.

Figure 6.1(c): Toys that can be Moulded

Figure 6.1: Toys used in Product Idea Generation

6.4 Focus Group Discussion for Product Idea Generation

A focus group was run with three of the groups, one group of children from each of the three age groups, that is six years, seven years and eight years (Groups B, C and F). Children of this age are used to sitting "on the mat" with the teacher for quiet class room activities such as stories or discussions so this technique was used to conduct the focus group. Each child was allowed to bring one toy each with them to the group discussion. The children were asked to discuss a series of open ended questions (Table 6.1) in order to obtain a list of attributes and new product ideas about the products with which they had been playing.

Table 6.1 Focus Group Questions for Product Idea Generation

What do you like about dolls?
What do you not like about dolls?
What do you like about modelling clay?
What do you not like about modelling clay?
Thinking about the things you like and do not like about dolls and modelling clay what sort of new doll would you like?

During the session they were allowed to play with or use the toys to demonstrate their point. The sessions were recorded by audio tape and the ideas were transcribed from the tape after the session.

6.5 Projective Techniques for Product Idea Generation

Two projective techniques were used by the three remaining groups, one from each age group (Groups A, D and E). The first technique involved the children writing a letter to their best friend telling them of a doll they had seen in the shops that they would like to buy, using the form shown in

Appendix 6.1. The second technique involved them drawing a doll they would like to have using the form in Appendix 6.2. The children were provided with plenty of felt pens, coloured pencils and a large piece of their "own space" to do the drawings. Time allowed to complete these two activities was approximately twenty minutes in total.

6.6 Product Ideas obtained using Focus Group Discussions

The focus group data produced comments based on the questions in Table 6.1 that each group was asked. Appendix 6.3 gives all the comments as recorded from each age group. Tables 6.2 and 6.3 summarise their likes and dislikes in terms of product attributes for dolls.

Table 6.2 Product Attributes Liked in Dolls Generated by Focus Group Discussion

Lots of clothes and accessories, eg, shoes, earrings, roller blades for playing
Long hair that can be played with
The doll must be pretty
The doll must be posable

When asked what they disliked, the six year olds stated that they found nothing they did not like about dolls, but after some prompting they managed to come up with a few items. On the other hand the seven year olds said they disliked everything about the dolls and were very insistent that they did not play with them "they only did their hair". The eight year olds were in-between these two extremes but had definite ideas about what they disliked about dolls and they appeared to play with them less regularly than the other two groups.

Table 6.3 Product Attributes Disliked in Dolls Generated by Focus Group Discussion

Short hair
Dolls that come apart: heads coming off, hair falling out, clothes breaking
Dolls that are too pretty or ugly
Dolls with an exaggerated female form
The style of clothes - the bustier "Madonna Style" did not appeal
Difficulty experienced in putting on the clothes
Losing the small accessories
Lack of ability to go in water

This technique also generated complete ideas for new products which are summarised in Table 6.4. These ideas were explained in long detail by the children that suggested them and many of the ideas were built upon by the other children in the group to produce a collaborative effort.

Table 6.4 Ideas for a New Doll Generated by Focus Group Discussions

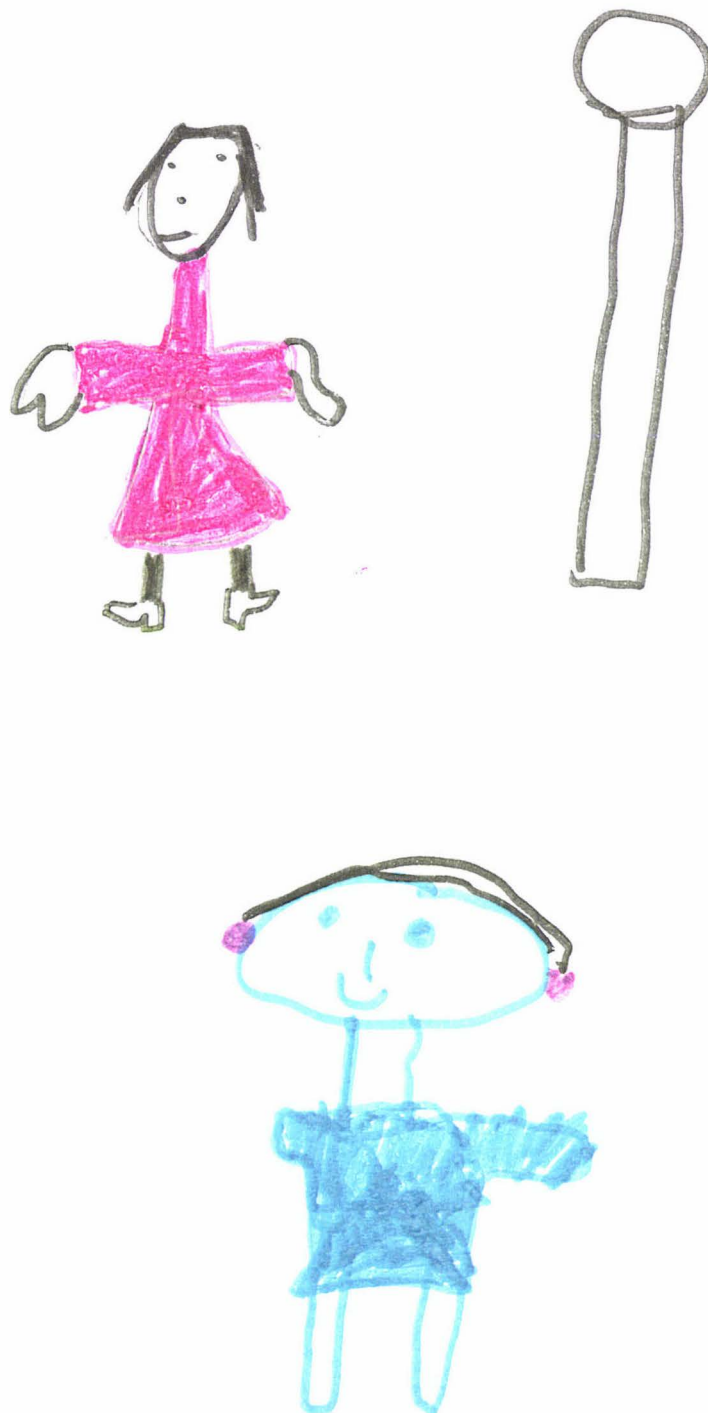
Make a doll out of modelling clay - Have parts of the doll already made, for example the face and make the arms, legs and body
Make accessories out of the clay: shoes, earrings, horse, car
Spray paint doll that the clothes can be washed off in water
Living doll - capable of doing many things itself eg singing, dancing, walking, talking, dressing
Computer operated doll
Hair colour change doll
Stick on clothes
Money box doll
A doll that can do homework, particularly maths

6.7 Product Ideas obtained using Projective Techniques

Figures 6.2(a) to 6.2(c) give examples of the sketches they drew that are typical for each age group. A full set of these are in Appendix 6.4.



6.2(a): Sketches of a New Doll from the Six Year Old Children



6.2(b): Sketches of a New Doll from the Seven Year Old Children



6.2(c): Sketches of a New Doll from the Eight Year Old Children

Figure 6.2: Examples of Sketches used to Generate Ideas for New Dolls and Preferred Product Attributes

Along with the sketches the children also wrote letters describing the doll they had drawn, examples of these are shown in figures 6.3(a) to 6.3(c). A complete list is in Appendix 6.4.

Dear Brooke

I went to town yesterday and saw this really neat doll. I have never seen a doll like this before, not even on T.V.

The doll was a talking & Sindy, it
had shinny ^{and} ~~hairs~~ ~~and~~ she
had pink lipstick on it.

The doll was I like boll to
play with My Saty
~~to~~ at West End
I like Siayd doll and
Biaty.

6.3(a): Letters about a New Doll by Six Year Old Children

Dear Anna,

I went to town yesterday and saw this really neat doll. I have never seen a doll like this before, not even on T.V.

The doll was called Hairy Face.
It can cook worms.

It was Hairy Because
It never brushed its
haire.

The doll was a good doll but it had
long hair because she never cuts her
hair and I like her and she plays
netball.

Dear Shayna

I went to town yesterday and saw this really neat doll. I have never seen a doll like this before, not even on T.V.

The doll was like a horse, a bit bigger than a rocking horse and it looked real. It said on the label, a pretend horse that runs and jumps it has a gear lever thing that makes it ~~go~~^{go}. It is really good for 8-9 year old children who like horses. I thought it was very neat. I asked mmm if I could have it of course she said NO! I thought I would never get it. I was so unhappy.

6.3(c): Letters about a New Doll by Eight Year Old Children

Figure 6.3: Examples of Letters used to Generate Ideas for New Doll and Preferred Product Attributes

The researcher then compiled a list of product attributes the children had described in their written descriptions and indicated in their sketches (Appendix 6.4) and a summary of these is in Table 6.5.

Table 6.5: Product Attributes Liked in Dolls Generated by the Projective Techniques

Hair that can be brushed, shiny hair, long hair, blonde hair and short hair
Ability to talk, walk, swim and sing
Beautiful clothes - modern and old fashioned
Accessories such as earrings and shoes and make-up,
Prettiness and ugliness

Complete ideas for new dolls were also generated by the sketches and the letters (Appendix 6.4).

Table 6.6: Product Ideas for New Dolls Generated by the Projective Techniques

A baby doll that walked, talked, jumped and swam
A princess type doll
A netball doll
A horse operated by levers
A madonna doll

The ideas for dolls and the product attributes generated by the projective techniques were combined with those generated in the focus group discussions and were screened by the children in the product idea screening session. Of the 110 ideas generated in the focus group discussions many were duplicated among the age groups. There was also duplication between the ideas generated in the focus group discussions and the projective techniques.

This duplication was assessed by the researcher and the number of ideas reduced. Any unoriginal ideas were also removed, that is products that were already on the market.

6.8 Evaluation of Product Idea Generation Techniques used with the Children

In general, as this was the first session of the project, the children were extremely excited about being involved but a little shy at the same time. This was why the defreezing session was so important. Allowing the children to play with the toys got them talking amongst themselves initially and then to the researcher, rather than just question and answer as it had been at the start of the session. This was most important for the three groups that had focus group sessions as their activity as setting the right atmosphere is critical to obtaining good results (Greenbaum, 1988).

The three focus groups were timed and all lasted marginally under eleven minutes. The six and seven year olds talked for 10 minutes and 54 seconds each and the eight year olds talked for 10 minutes and 35 seconds. After this time they lost interest in the topic being discussed. This is a relatively short period of time but is supported by the idea that in group sessions children should change activities about every fifteen minutes (Marney, 1991). This was the first session for the children and it would have been interesting to see if a focus group discussion towards the end of the project would have continued for a longer time and produced more information.

As could be expected the six year olds produced less ideas than the seven year olds who in turn produced less ideas than the eight year olds especially in the new doll category (Table 6.7).

Table 6.7 Comparison of the Number of Product Ideas Generated by each Age Group in the Focus Group Discussions

Topic	Number of Ideas		
	Six Years	Seven Years	Eight Years
Why liked dolls	8	9	12
Why disliked dolls	3	11	8
Like/Dislike Modelling clay	5	4	4
New Doll ideas	9	14	23
Total	25	38	47

All the "Rules" for conducting Focus Groups with children as summarised from the literature in Table 2.4, were followed except the provision of food or drink. As the children were only involved in the one activity this was not deemed to be necessary. The encouragement to bring toys to the group and to use them to illustrate their ideas worked well as they were able to show as well as describe verbally. This helped to move the Focus Group sessions away from an adult oriented approach (McDonald and Topper, 1988).

In the Projective Technique sessions all the children, except one, managed to complete a story and a picture. The one child that chose not to draw a picture as she was "not good at drawing", wrote an extra long letter instead. It was obvious that even by the age of eight years, the children already realise they have limitations to their skills. All of the children wrote the stories without assistance from the researcher, except for the spelling of the odd word. There was an obvious increase in competence of the eight year olds over the six and seven year olds in terms of the sketches and the letters. There was clearly the occasional child in the younger groups that was operating above its peer group in this area, but they were the exception rather than the rule. This technique worked extremely well as it is an activity that the children do all the time at school and at home. They are used to it, and as a technique it is already child focused (Gordon and Langmaid, 1988).

6.9 Discussion on Product Idea Generation for Toys

It was interesting to note how the different age groups played with the dolls. The six year olds saw them simply as a toy to be played with and were not all that specific as to what they did. The seven and eight year olds clearly saw the doll as a little person to whom they could relate, and with whom they could be involved in activities. This was backed-up by watching them play with the dolls during the defreezing session.

Sutton-Smith (1986) in his book "Toys as Culture" stated that, amongst other things, toys provide entertainment and education for children. For the younger children these are provided by the dolls at a fairly simple level and most likely in such a way that it happens without them thinking about it and therefore they cannot verbalise it. For the older children the games they play are quite sophisticated and of their own making; playing school, house and fashion parades are common examples. They can describe these in great detail and these activities keep them amused for hours.

A closer examination of the doll attributes the children gave in the sessions showed quite clearly the attributes they considered important in a doll; age, hair, size, appearance and added features. The same attributes occurred in all the groups. Playing with the dolls helped them to identify the attributes and their statements could be backed up by watching them play.

The ideas for new dolls to some extent came out of other topics of conversation in the focus group whereas those obtained from the Projective Techniques tended to come from other interests the children may have had, such as the netball doll, computer doll, a horse and Madonna.

The presence of the horse in the list of ideas may seem to be out of place and this is worthy of comment. The rest of the products are "dolls", however the female children would play with such a horse in the same way as a "doll" and

the fact that it is not human does not preclude it from being seen in the same category. Therefore the researcher did not screen the horse from the list of product ideas.

6.10 Conclusion

The children managed well both of the Product Idea Generation Techniques. The older children produced more ideas in the Focus Group Discussion and their sketches and stories were more detailed. These techniques were similar to activities they undertook in the school environment everyday and so they had no difficulty understanding what was expected of them. This was beneficial as it was the first session of the Small Group Study and put the children at ease in terms of what was going to be expected of them in terms of performance.

The six sessions, three each of focus group discussion and of projective techniques, produced, for screening, eleven new product ideas (Table 6.8) and five product attribute categories containing twenty three attributes (Table 6.9).

Table 6.8 shows the complete product ideas to be screened by the children in the second stage of the project. These ideas were taken from the Focus Group Discussions and the Projective Techniques performed by the children. In general, the projective techniques tended to produce complete ideas for new products while the focus groups tended to produce desirable attributes rather than complete product ideas.

Table 6.8 Product Ideas for New Dolls

A netball doll in a silver fern uniform
Electronic doll
A doll controlled by a computer
A doll face with body moulds that can be made out of modelling clay and baked to given different bodies
A doll with clay and moulds so accessories can be made
Spray paint doll where the clothes can be painted on and washed off in water
A doll with different wigs and hair styles you can change
A doll that looks and sings like Madonna
A baby doll that walks, talks, crawls and swims
A horse operated by levers
A doll with very flexible arms and legs

The focus groups and the projective techniques also produced a list of product attributes for screening in the second stage of the project by the children, Table 6.9

Table 6.9 Product Attributes Liked in Dolls

Doll Age	Appearance
Baby doll	Looks like a princess
Teenage doll	Ugly
Adult doll	Pretty
Doll own age	Not pretty nor ugly
Hair	Activities the doll can do
Short Hair	Talking oll
Long hair	Doll talks back
Black hair	Singing doll
Blonde hair	Walking doll
Accessories	Arms/legs move lots of ways
Modern clothes	Doll Size
Stick on clothes	Small doll
Goes in water	Large doll
Own make-up	

These product attributes and new product ideas were then screened in the next session with the children using scales and card sorting techniques.

Chapter 7

Product Idea Screening by Children

7.1 Introduction

The idea generation techniques produced two types of information - product ideas and product attributes - that needed to be screened. Two techniques were used to screen the product ideas - scaling and sorting. Two scales were used to screen the complete product ideas; a Word Scale and a Smiley Face Scale, with half the children using each scale. This was to enable a comparison between the scales to be made. The product attributes were screened using a sorting technique. Each attribute was written on a separate card and the children sorted the cards twice. In the first sort they put the cards into two categories, those attributes they "liked" and those they "disliked". They then took the attributes in the "like" category and sorted them into three further categories depending on the strength of liking.

7.2 Defreezing

As there were no toys to play with in this session, the defreezing technique used was a discussion on what the children had done for their mid-term break which had just occurred before these sessions. The reporting and discussion of the idea generation results also acted as a defreezing technique, by getting the children asking questions, making comments and talking generally on the topic.

7.3 Methods of Product Screening

7.3.1 *Product Attributes Sorted by Cards*

For screening the product attributes, all the girls participated in a sorting technique which was developed in the form of a "Posting Game". Each attribute was written on a card to provide a set of twenty three cards, one attribute per card (Appendix 7.1). Each child received a set of cards; each set was a different colour so the individual children could all be identified later if required. As a group, the children and the researcher went through the cards one by one and discussed all the words so the children were clear on the definitions. During the session the children could ask about words they could not remember.

Due to the large number of cards, the sorting was in two stages. The first stage involved sorting into two piles; things they liked and things they did not like. The "did not like" cards were posted into a box and the like cards were then sorted again into three piles and posted into three boxes to indicate degree of liking. Box One-"like the best", Box Two-"like okay" and Box Three-"like a little or kind of like". The children were allowed to choose the colour cards they wanted and then spread themselves out in different parts of the room on the floor so they could spread their cards out and sort them. Each time they had to post their pile of cards into a box they came into the centre of the room with the cards they had sorted and "posted" them. This gave them plenty of space and prevented collusion. The sorting data is found in Appendix 7.4.

7.3.2 *Product Ideas Screened by Rating on Hedonic Scales*

The eleven complete product ideas were written as short product concepts by the researcher based on what the girls had written, drawn or said in the idea generation sessions. These were scored on a Smiley Face Scale as shown in Figure 7.1 or using a word scale shown in Figure 7.2. The allocation of the scale to the groups was carried out by ballot, in the same way as for the idea generation techniques. Groups B,C and F used the Smiley Face Scale and

Groups A,D and E used the Word Scale. This gave one group in each of the three age groups using each scale. The Smiley Face Scale was a stylised one, generated on a computer and given a female gender. This was appropriate as all the children were female. Choice of the words used on the word scale was difficult. While it is generally not good practice to use buzz words on a scale the words "gross" and "choice" were used by the children in the idea generation to describe various aspects of the dolls and it was clear that all the children knew the meaning of the words. Before the scale was used this was confirmed by discussing the scale with each group. A copy of the questionnaires are in Appendices 7.2 and 7.3.

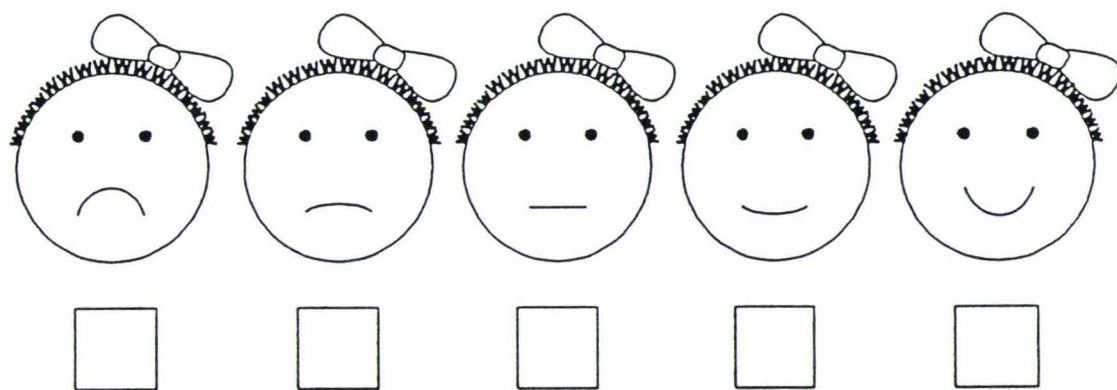


Figure 7.1: Smiley Face Scale for Product Idea Screening

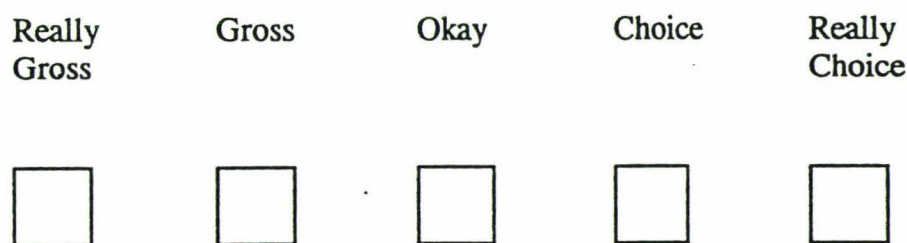


Figure 7.2: Word Scale for Product Idea Screening

The scale being used by the group was discussed with the girls so they all had a clear idea of what each face or word meant. The children then scored each concept on the scale individually. For the younger groups, the children took it in turns to read the concepts out loud one at a time and then scored them individually. Some of the children coloured in the face scales during the session. They could mark the boxes in any way they chose; ticks, crosses, or by colouring in the squares.

7.4 Product Attribute Screening

All of the thirty nine children that participated in sorting test completed it, although 3 of the six year olds and 2 of the seven year olds required help from the researcher with reading the cards so they could sort them. All of the thirty nine sets of cards were left in the sample as there was no substantial evidence that the children had failed to understand the task being asked of them.

Figure 7.3 shows the percentage of children who liked or disliked a certain attribute, as determined from the first sort, ie when the children sorted the cards into two groups; like and dislike.

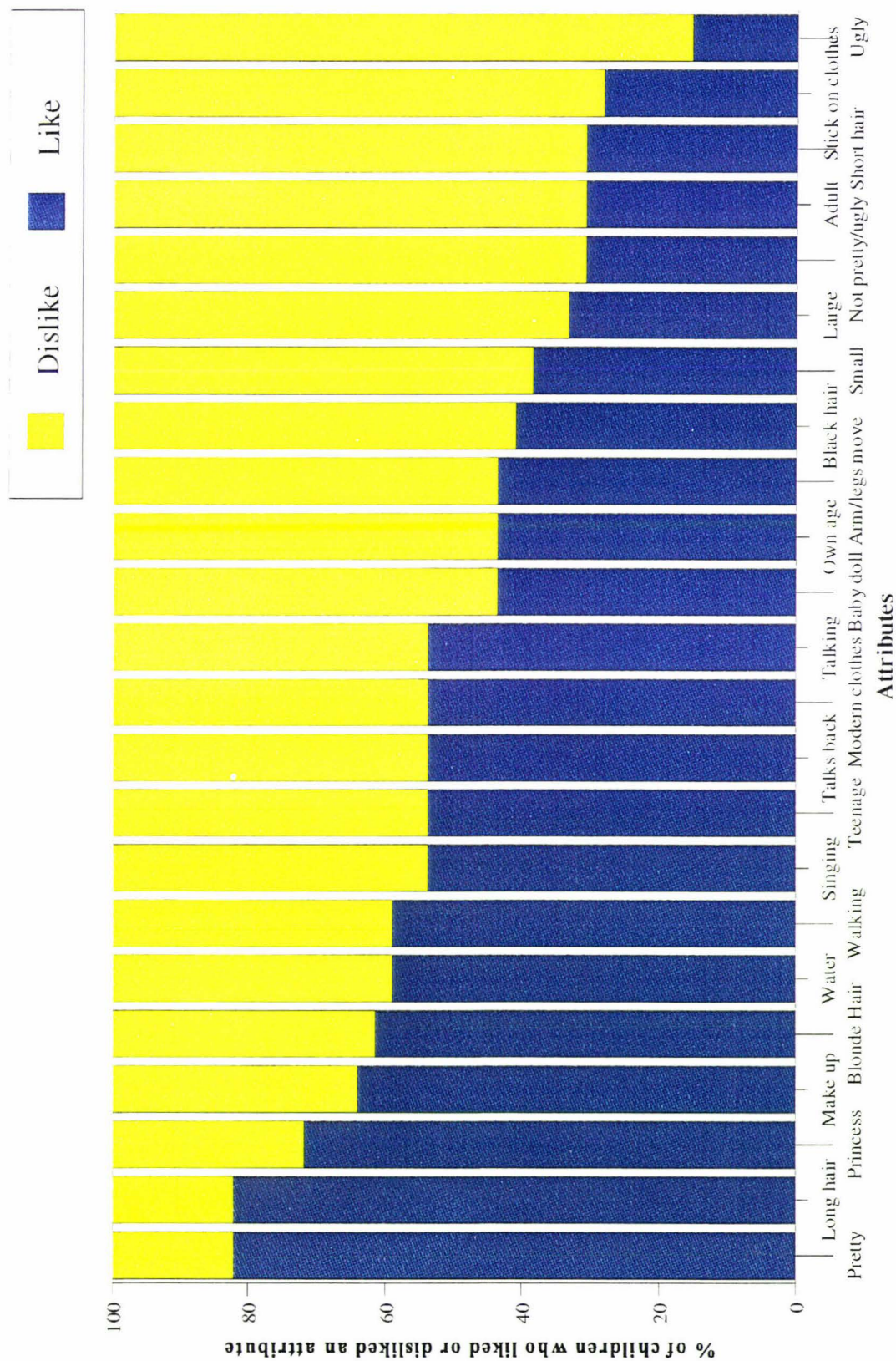


Figure 7.3: Liking and Disliking of Product Attributes

Based on the hypothesis that the sorting between the boxes was random, chi squared calculations were used to determine if there were significant differences in terms of liking. Analysis of the total like and dislikes determined by the first sort the children completed, produced the Chi-squared values in Table 7.1.

Table 7.1: Product Attributes Significantly Like or Dislike

Attribute	Chi-squared value	Significance
Age of Doll		
Baby doll	0.01	
Teenage doll	0.23	
Adult doll	5.76*	Dislike
Doll own age	0.64	
Hair Type		
Short hair	5.76*	Dislike
Long hair	16.02*	Like
Black hair	1.25	
Blonde hair	3.10	
Doll Size		
Small doll	2.07	
Large doll	4.33*	Dislike
Appearance		
Looks like a Princess	7.41*	Like
Pretty	16.00*	Like
Not pretty nor ugly	5.76*	Dislike
Ugly	18.69*	Dislike
Activities the doll can do		
Talking doll	0.23	
Doll talks back	0.23	
Singing doll	1.25	
Walking doll	1.25	
Arms/legs move lots of ways	0.64	
Accessories		
Modern clothes	0.23	
Stick on Clothes	7.41*	Dislike
Goes in water	2.00	
Own make-up	7.41*	Like

Note: (1) *Significant where degrees of freedom = 1 and the Chi-squared value = 3.84

(2) Total children in the sample = 39

Table 7.2 shows that ten of the twenty-three attributes were significant, either in terms of like or dislike. If the attributes are examined in their groups it is clear that some of the categories have more effect on preference than others.

Table 7.2: Significant Product Attributes from Sorting

Dislike	Like
Ugly Stick on clothes Short Hair Adult doll Not Pretty or Ugly Large doll	Pretty Long hair Looks like a Princess Own Make-up

Appearance was the most important, with all attributes within the group being significant, the activities the doll can perform had no attributes significant. There were also difference within groups, that is, length of hair was more important than colour. A more detailed study of how children play with the dolls would reveal why this is so. For example, the focus groups in the idea generation sessions revealed that they brush the doll’s hair, supporting why they like long hair and dislike short hair and why colour is not important.

Examining all the "like attributes", that is, attributes where the "like" score in the first sort, between like and dislike, was greater than fifty percent, Figure 7.4 shows a clear tendency for the children to use the top end of the liking scale with very little differentiation between degrees of like. This trend increased as the higher liking in the first sort the higher the percentage score was for "like a lot".

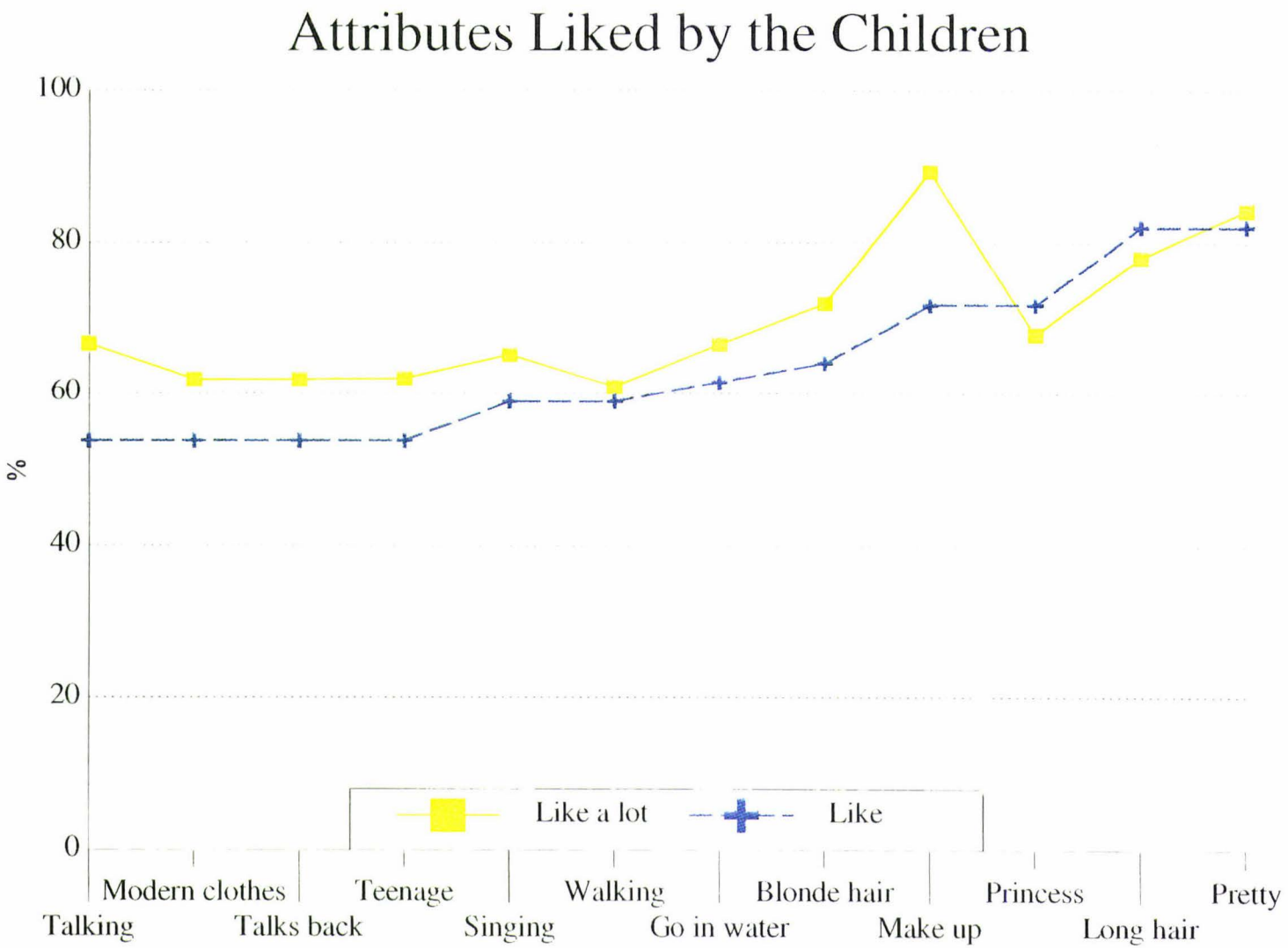


Figure 7.4: Percentage "Like" and "Like a Lot" of Product Attributes

7.5 Product Idea Screening

The Smiley Face and the Word Scales were compared to see if there was a significant difference in the results that were obtained from each scale. This was done using an analysis of variance with Stats-Packets Statistical Analysis Package, Appendix 7.5. The analysis of variance between the two scales had a t value of 0.41 and a p value of 0.68. As there was no significant difference between use of the word scale and the face scale the data was combined and treated as one for the analysis.

As a mechanism to remove the data provided by those children who may not have understood the scaling exercise an analysis of variance using Stats-Packets was then carried out to determine if any of the children were markedly different from the rest of their age group in terms of scores. Any child that had significantly different scores (at $p < 0.05$) from more than seven of the other children in their age group was removed from the analysis, Table 7.3. This was done to remove from the sample the data from those children whose scores were different from more than half of the other children in their age group. Using a cut-off point of the data from a child being significantly different from greater than seven other children, this resulted in the data from; 2 of the six year olds, (child 2 and 13), 3 of the seven year olds, (child 3, 6 and 13), and 1 of the eight year olds, (child 11), being removed from the sample. This assumption was backed up by observations made during the sessions. In the six year old age group Child 13 was a five year old that had difficulty reading the questionnaire as did child 2. In the seven year old age group one child had trouble with reading the other two were showing signs of poor concentration, acting the fool and general misbehaviour. In the case of the eight year old no particular behaviour or problem was observed during the session. A full analysis can be found in Appendix 7.6.

Table 7.3 Number of Children with which each Child had Significantly Different Data within their Age Group

Child Number	Six Years	Seven Years	Eight Years
1	4	6	3
2	9	5	3
3	3	9	1
4	4	7	3
5	2	4	6
6	1	10	3
7	3	7	1
8	3	3	6
9	2	5	4
10	2	5	1
11	2	7	8
12	2	9	3
13	9	5	
14	0		
Total	46	82	42
Total Pairs	23	41	21

An analysis was then carried out giving means and standard deviations for each of the product ideas for the complete group of children Table 7.4. The results for the three age groups can be found in Appendix 7.7.

Table 7.4: Liking of Product Ideas

Product Concept	Mean (S.D)
Horse	4.1 (1.2)a
Computer doll	3.6 (1.2)ab
Spray paint doll	3.5 (1.2)b
Baby walking doll	3.4 (1.4)b
Doll with clay accessories	3.4 (1.5)b
Flexible arms and legs	3.2 (1.4)bc
Doll with wigs	3.1 (1.5)bc
Netball doll	3.1 (1.4)bc
Madonna doll	3.0 (1.5)c
Electronic doll	2.8 (1.4)c
Doll with clay body	2.8 (1.4)c

- Note:
- (1) Scores on the Smiley Face and word scales were converted to scores of 1, 2, 3, 4 or 5
Where 1= a very sad face or really gross 5 = a very happy face or really choice
 - (2) Total children in sample = 33
 - (3) The numbers in parentheses are standard deviations
 - (4) Mean Scores within the column followed by different letter are significantly different at $p < 0.10$

The horse was the most preferred concept by the total group of children (Appendix 7.8). Comparing the mean scores given to the eleven products for each age group to see if there was an obvious difference between the age groups, Table 7.5.

Table 7.5: Liking of Product Ideas by Age Group

	Six	Seven	Eight
Product Concept	Mean(S.D)	Mean(S.D)	Mean(S.D)
Horse	4.2(1.0)a	4.1(1.3)a	3.9(1.5)a
Computer doll	3.8(1.3)abc	3.5(1.4)ab	3.4(1.1)ab
Spray paint doll	3.9(1.2)abc	3.4(1.2)ab	3.2(1.3)ab
Doll/clay accessories	4.0(1.3)ab	3.3(1.7)ab	3.0(1.4)ab
Baby walking doll	3.7(1.7)abcd	3.1(1.6)ab	3.5(1.0)ab
Flexible arm/leg doll	3.8(1.2)abc	3.4(1.3)ab	2.4(1.4)b
Netball doll	3.2(1.7)abcde	2.7(1.6)b	3.3(0.9)ab
Doll with wigs	2.7(1.7)de	3.8(1.1)ab	3.1(1.6)ab
Madonna doll	2.9(1.4)cde	2.8(1.7)b	3.3(1.6)ab
Electronic doll	2.5(1.2)e	2.8(1.8)b	3.0(1.3)ab
Doll with clay body	3.0(1.4)bcde	2.5(1.7)b	2.7(1.3)b

- Note:
- (1) Scores on the Smiley Face and word scales were converted to scores of 1, 2, 3, 4 or 5
Where 1= a very sad face or really gross 5 = a very happy face or really choice
 - (2) The numbers in parentheses are standard deviations.
 - (3) Mean scores within the column followed by a different letter are significantly different at $p<0.05$.

Table 7.5 shows the horse idea (pony doll) was a unanimous first in each of the age groups (Appendix 7.7). It was not possible to judge if the difference of the pony doll concept , a pony doll, from the other concepts being tested, which were all versions of human dolls, had an effect on the liking scores it received. However because it was so overwhelmingly popular by all age groups it choice as most preferred concept could not be ignored. It had been assumed that the children would see it as just another version of a doll and there was no evidence to suggest that this assumption was incorrect.

7.6 Evaluation of the Screening Techniques used with the Children

The sorting technique used was a variation of the "Postbox Technique" described by Gordon and Langmaid (1988). It was difficult to tell if all the children completed the sorting technique in a competent fashion, however other researchers have found it to be successful and easily handled by the children (Gordon and Langmaid, 1988). They obviously enjoyed it, going off with great enthusiasm to their own little corner to sort the cards in the colour of their choice and returning to post them in the boxes. No copying occurred with this technique as they were all very secretive about their cards. In general the children handled the first sort well, separating the "like" and "dislike" clearly. The second sort defining how much they liked the product concept showed that if they liked the product concept they liked the product concept a lot. It was not obvious if this occurred because either; that was how they felt, or if they had difficulty with the concept of the second sort. Observations showed that the children tended to have extremes of like and dislike. They did not appear to have a lot of grey in between their "black and white". Therefore the former seems the most likely as supported by Figure 7.4 which shows that the high percentage in the first sort corresponded to a high percentage for "like a lot".

Use of the scales was also most successful. The data from six of the children was removed from the sample because their data showed marked variance from the rest of their group. This task was performed to screen those children that had difficulty completing the scaling task. In the six year old group the questions were read out and the ideas considered one at a time, so the reading was not a barrier, if they understood the scales. Maybe reading aloud should have been carried out with the seven year olds shows that there was much more variance in their data than with the six and eight year olds groups. This difference could have been caused by poor written comprehension by some of the seven year old children which did not allow them to score the ideas properly.

The product idea mean liking scores of the complete group showed that the children used the top end of the scale with the lowest mean score for a product being 2.76 out of a maximum score of 5. This once again showed that they had strong feelings of like as in the card sorting exercise.

There was no difference between the results obtained from the Smiley Face Scale and the Word Scale, showing that the children had an equal understanding of them both and used them in the same way. This is supported by the findings of Kroll (1990) who also found that the children could handle word scales as competently as face scales. The choice to make the Smiley Face Scale gender specific but still stylised was a good one. Children in all the groups commented on the faces and many personalised them by colouring in the faces especially the bows on the heads. There seems to be little point in using sophisticated scales, such as the Audio Visual Children's Scale (Lebender, 1978) when they can handle simple word or face scales with such success. However there may be a place for such scales where the children are younger and pre-literate.

7.7 Discussion of Toy Product Ideas Screening

The sorting provided clear information on what attributes the children liked and disliked in terms of dolls. It was obvious that appearance is all important along with hair length. Age and size of doll was generally not a significant factor except that they had a dislike for adult dolls and large dolls. Activities that a doll can perform appeared to have no influence on preference, however dolls that talk, walk and so on are popular so it is likely that these are secondary factors that children consider after the main attributes have been met. For example, a short hair doll that walks, talks, sings, eats and drinks is not likely to be preferred above a pretty long hair doll that does nothing. While it is not the purpose of this project to evaluate the toys, the results of the attribute sort were not unexpected because of what the children do with dolls in their play routines. They like to brush, plait and restyle hair which accounts for the

preference for long hair. They carry their favourite doll around with them therefore they want it to be small. Most of their games are make believe, role playing so they would not want an adult doll to play school or get ready for parties.

Scales were used to rate the complete product ideas. These results did not come out as would have been predicted based in the sorting of the attributes. As hair is important to the children if a prediction had been made the "Doll with wigs" would have been the most likely first choice. The "Horse doll" was the most preferred by all groups. This clear preference in all the three age groups was unexpected also as normally there is a difference in preference between the age groups because of their different play needs. The "Horse doll" obviously had universal appeal. The closeness of the other product ideas was shown with no significant difference between the "Computer doll" in second place and the "Madonna doll" in ninth place. Only the last two the "Electronic doll" and the "Doll with the clay body" were significantly less liked than the others.

7.8 Conclusion

The sorting technique and the scales proved to be successful with all; the three age groups. Care does need to be taken that the children do understand what attributes or product descriptions mean. If the barrier to written understanding is removed they do not appear to have any difficulty with the task of sorting or scoring an idea on a scale. There was not any difference between the performance of the Smiley Face Scale and the Word Scale except that the children enjoyed colouring in the Smiley Face Scale which extended the length of the session and enabled them to personalise their work which they find very important.

The sorting of the attributes showed how important prettiness or the lack of it is in terms of a doll, with pretty, being significant in terms of liking, and ugly

and neither pretty or ugly in terms of disliking. Long hair was also a most important liked attribute. The screening produced a most preferred complete product idea of a pony doll rather than a human doll, which required a change in direction for the project. The product concept development stage therefore had to focus on pony doll products. Due to this change it was important to see if the prettiness attribute that had been so important to the dolls was also important to these pony doll products and so this was tested in the next stage to aid with the concept development.

Chapter 8

Product Concept Development By Children

8.1 Introduction

The screening stage led to a focusing of the project product from general dolls to "Pony dolls". This new focus required a little more information about the products on the market and a way to redirect the groups to thinking in the new product area. Therefore the children were presented with nine different horses that were currently being sold in Palmerston North stores.

The six groups of children performed both the activities in this session. Firstly, they completed a questionnaire to provide information on what were the most preferred products in these new category, so that the concepts developed by the children in this stage of the project could be tested against popular products in the final product concept testing stage. Prettiness had been determined as a main attribute with the "Sindy dolls" and it was important to see if this was a leading attribute of the "Pony dolls". For this reason, as well as preference, the children were asked to score the "Pony doll" products on prettiness so that a correlation could be made between overall preference and the single attribute of prettiness.

The second activity provided the data for the Conjoint Analysis. The Conjoint Designer produced eleven concepts based on the four attributes: movement, colour, size and noise. The children were given these concepts written on cards, which they put in order of preference by sorting the cards into order and then transferring the order to a scoring sheet. This data was then used in the Conjoint Analysis Programme to produce five concepts for testing in the last stage of the project, product concept testing.

8.2 Defreezing

The session started with a discussion with the children about what they had been doing since we last met. They talked about any birthdays or exciting happenings. The results from the screening session were discussed along with a general introduction on the day's activities. Due to the change in products the last part of the defreezing process of this session involved playing with and talking about the various "ponies" that were presented. This lasted for fifteen minutes. The nine commercial "Pony dolls" are shown in Figure 8.1



(L to R) MLP Sweetsteps Ballerina (Tip Toes), MLP Teeny Tiny (Little Whiskers), Grand Champions(The Stable of Pure Breeds), MLP Paradise Baby(Baby Beach Ball), MLP Cutie Club (Party Collection),Grand Champions (Stallion with Sound), Sylviana Family Pony, MLP Sweet Talking Pony, MLP Sweet Kisses (Happy Hugs).
(Note MLP is the My Little Pony Brand)

Figure 8.1: Pony Dolls on the Market

The "Pony doll" products chosen by the researcher for use in this session represented a cross section of the products on the market in Palmerston North.

They were chosen to give a broad range within the product attributes, for example, colours from bright orange and pastel purple to the real horse colours of white and brown. Some of the horses looked and sounded like real horses, others were definitely "cute" versions. One of the products talked and another made real horse noises.

8.3 Preference and Prettiness of Pony Dolls

One of the main attributes that had emerged from the previous work with dolls was prettiness. There was a need to see what prettiness meant as related to "Pony dolls" and whether it was an important criterion in preference. This data was collected by using a simple questionnaire, that was completed by all the children, Appendix 8.1. Table 8.1 shows a summary of the questions asked.

Table 8.1: Questions for Evaluation of Preference and Prettiness of "Pony Dolls"

Prettiness	What five horses are the prettiest? Put the five horses in order of prettiness Why is horse number one the prettiest? Which horse is the least pretty and why?
Preference	Which six horses would you keep? Put them in order from most favourite to least Why is horse number one your most favourite? Which horse do you dislike the most and why?
Ownership	Do you have any horses at home and how many?

The children chose six of the nine horses and put them into order of preference and also chose five of the nine horses in the order of prettiness. The difference

in numbers was to stop the children repeating their choice. They were likely to write the same numbers twice if they had to choose exactly the same number of "Pony doll" for both of the questions. By altering the numbers they were less likely to see the relationship between the questions. The researcher then scored the answers. The higher the score the more preferred or pretty they thought the "Pony doll", maximum score was six for most preferred and five for prettiest. The totals were then divided by twenty-five (number of children) to give mean scores. A correlation coefficient was calculated for the mean preference and mean prettiness scores using Minitab and the significance evaluated using the Pearson Product-Movement Correlation Coefficient Table. The children also stated reasons for their first choice in terms of preference and prettiness.

The children also had to choose one "Pony doll" as the most disliked and one as the least pretty and state a reason for their choices. As well as providing valuable information it also provided a checking mechanism. For example, if the "Pony doll" chosen as the least pretty was one of the "Pony dolls" chosen in the five "Pony dolls" put in order of prettiness then the questionnaire was removed from the sample as the data was not consistent. It should have been one of the other four "Pony dolls" not one of the horses chosen in their first five. This data was also correlated using Minitab and significance evaluated using the Pearson Product-Movement Correlation Coefficient Table.

Lastly in order to check that these children were in the target market for these products they were asked how many they had at home.

8.4 Conjoint Analysis

Conjoint analysis was used to develop concepts from attributes that were deemed to be important, either, by the children from the screening of the attributes or by examination of commonly occurring attributes found in the products already in the market place. The first part of the process involved

using a part of the Conjoint Analysis Computer Programme called the "Conjoint Designer" to develop the concepts for testing. The attributes of colour, movement, size and sound were used in the designer programme at the levels shown in Table 8.2 to produce nine combinations and two "holdout" combinations. The "holdout" combinations were used to estimate the reliability of the results.

Table 8.2: Attributes and Levels for "Pony Dolls" used for the Conjoint Analysis

Colour	Bright Pastel Normal horse colour
Movement	No movement Posable Moved with controls
Size	Small toy size Large toy size Size that could be sat on
Sound	No sound Talking Horse sounds

These eleven combinations were then developed into short product concepts by the researcher (Table 8.3). These concepts were written on individual cards in 18 point print, each card had a number on the back to allow the children to identify them.

Table 8.3: Product Concepts for "Pony Dolls" Generated by the Conjoint Designer

1	This horse is the size of a large toy. It makes no noise and is the colour of a real horse. It can be made to move using levers and controls.
2	This horse can talk. It is the size of a large toy and cannot move. It comes in colours like pale blue, pink and purple.
3	This horse makes noises like a real horse. It is the size of a large toy and comes in bright colours. You can move its head and legs into different positions.
4	This horse makes noises like a real horse. It is large enough to sit on. It does not move and is the colour of a real horse.
5	This horse is large enough to sit on. It makes no noise and comes in pale colours, like blue pink and purple. You can move its head and legs into different positions.
6	This horse is a bright colour. It is large enough to sit on and can talk. It can be made to move using levers and controls on the horse.
7	This small talking horse is the colour of a real horse. You can move its head and legs into different positions.
8	This small horse makes noises like a real horse. It comes in pale colours like blue pink and purple and can be made to move using levers and controls on the horse.
9	This small horse comes in bright colours. It makes no noise and does not move.

Holdout Concepts (used to test reliability of the data)

10	This small horse can talk. It comes in bright colours and does not move.
11	This horse is large enough to sit on. It is the colour of a real horse and makes noises like a real horse. It can be made to move using levers and controls on the horse.

To obtain the data for the Conjoint Analysis the children were each given a set of eleven cards and a form to complete (Appendix 8.2). The cards were each read out and discussed with the children so that they understood the different terms in the concepts. Commercial ponies were used, where possible, to show colours, size, noise and movement. After going to different parts of the room and spreading the cards out on the floor, they sorted the cards into order from the one they liked best to the one they liked the least. Once they had done this they turned the cards over and wrote the numbers off the back of the cards onto the form. In this way a preference order was obtained for the concepts produced by the Conjoint Designer. The preference data was then analysed in

Correlation coefficient of the mean scores had a value of 0.98. A test for significance was carried out, where $n = 9$ $df = 7$ giving a value of 0.80 at $p < 0.01$, using the Pearson Product-Moment Correlation Coefficient Table showing the correlation to be significant. The scores from the individual children are in Appendix 8.3

As can be seen in Table 8.4 there were significant differences between the means of many of the horses in terms of preference. The horses could be split into two groups with the four most preferred being the "Brown/White Noise Horse", "Purple Talking Horse", "White Horse" and the "Lipstick Horse" and the rest of the horses in a second group that was less preferred. The significant differences in terms of prettiness were a little less defined but the same pattern was evident. The complete analysis is in Appendix 8.4. Analysis of the first choice of the children for most liked and most pretty horses is shown in Table 8.5.

Table 8.5: Most Liked and Most Pretty "Pony Dolls"

Horses	Most Liked	Most Pretty
Noise Horse	11	8
Talking Horse	4	6
Lipstick Horse	3	3
Ballerina Horse	3	2
Baby Horse	1	2
Sylviana Horse	1	1
White Horse	1	1
Paradise Horse	1	0
Small Horses	0	2
Total Number of Children	25	25

Correlation of this data, using Minitab, gave a value of 0.89, compared to 0.8167 at $p < 0.05$ using the Spearman Test Statistic, for nonparametric data, where $n = 9$ (Conover, 1980, p 456). This showed a significant relationship between "most liked" and "most pretty". The reasons given for prettiness, in summary, were: they liked the colour of the hair, the noise, the clothes and the accessories. They liked horses in general, and they deemed them to be "cute". The reasons

for overall preference were very similar to those given for prettiness and many of the children wrote exactly the same comments. The full list of reasons given for the choice of a horse as most liked or most pretty are given in Appendix 8.5.

The children were asked to pick the horse they disliked the most and they found the least pretty. Table 8.6 shows the number of children that chose each horse.

Table 8.6: Disliked the Most and Least Pretty "Pony Dolls"

Horses	Disliked the Most	Least Pretty
Sylviana Horse	7	7
Ballerina Horse	7	7
Paradise Horse	4	3
Lipstick Horse	2	3
Baby Horse	2	2
Small Horses	1	2
White Horse	1	1
Talking Horse	1	0
Noise Horse	0	0
Total Number of Children	25	25

A correlation, using Minitab, of the data in Table 8.4 showed a significant relationship between the dislike of a "Pony doll" and how they thought it looked in terms of "lack of prettiness". The correlation value was 0.95, compared to 0.9000 at $p < 0.01$ using the Spearman Test Statistic, for nonparametric data, where $n = 9$.

The reasons why the horse was "least pretty" tended to focus on the colour: they did not like brown nor bright orange nor purple, or in some cases the colour of the hair was not pretty. They also commented on the ugliness of the horse because it was "tatty", had curly hair, could not talk, or dressed too "posh". The size of the very small horses was also a reason for them not being pretty. Reasons for disliking the horse were similar. The fact that it was "ugly" was a

popular reason for dislike, along with colour and the type of hair. They also disliked the horse because they did not like the noise it made nor the size it was. The full list of reasons given by the children for their choices of "most disliked" and "least pretty" are in Appendix 8.6.

There are a few points worthy of discussion with relevance to this stage of the project. It was clear from the analysis of the questionnaires that prettiness and preference were closely related. This relationship between prettiness and preference was confirmed by the reasons that the children gave for their choices in Appendices 8.5 and 8.6. Most of the children give the same reason when asked why they chose a horse as most pretty or liked and least pretty or disliked. Prettiness was not just visual although visual aspects were an important component of prettiness, it also included ability to talk and make a noise and whether the hair stays on. A closer examination of Table 8.4 shows that the Paradise horse is the only anomaly to this, fifteen children chose it in terms of preference but only nine in terms of prettiness. The problem with this product appeared to be the colour of its body, orange. The horse had an appealing face, long purple and pink hair, was medium sized and a unicorn; this would appear to be a popular attribute mix, except for the colour (Figure 8.2). It would be interesting to ask the children to score the same product with a different coloured body and see how it rated.



Figure 8.2: Paradise Horse

A check was made that these children were indeed the target market for these products by asking if the children had any of these types of horses at home. Of the twenty-five children, thirteen did not own any "Pony dolls" and twelve did. Of those that had "Pony dolls" the number owned ranged from one to ten with an average of three per child. This showed that children in the age group liked the "Pony Dolls" enough to purchase them, or request purchase as gifts which confirmed that they were in the target market group for these products.

8.6 Development of Product Concepts using Conjoint Analysis

Twenty-seven of the thirty-eight children completed the conjoint exercise. The

other eleven children either could not read the cards or did not have the ability to put all the eleven cards into an order. They did not complete the task in the session and therefore submitted incomplete forms. The eleven children that did not complete the exercise were made up of 10 six year olds and 1 seven year old. Five of the twenty-seven children, 1 six year old and 4 seven year olds, that attempted the exercise were not able to complete it with any sort of validity so their data was removed from the sample. These children had simply written one to eleven next to the letters A to K and this data was removed before the analysis was carried out. This left a sample of twenty-two children. The twenty two children in the sample were made up of 4 six year olds, 6 seven year olds and 12 eight year olds.

Figure 8.3 shows the percentage of respondents that preferred each level of each attribute. This was calculated by the Conjoint Analysis Programme based on the order provided by the children for the various product concepts. If all the preferred levels were put into one product it would be a large talking horse, pastel in colour and with controls that enabled it to be moved. This would be the product the children would rate highest for preference if it was developed.

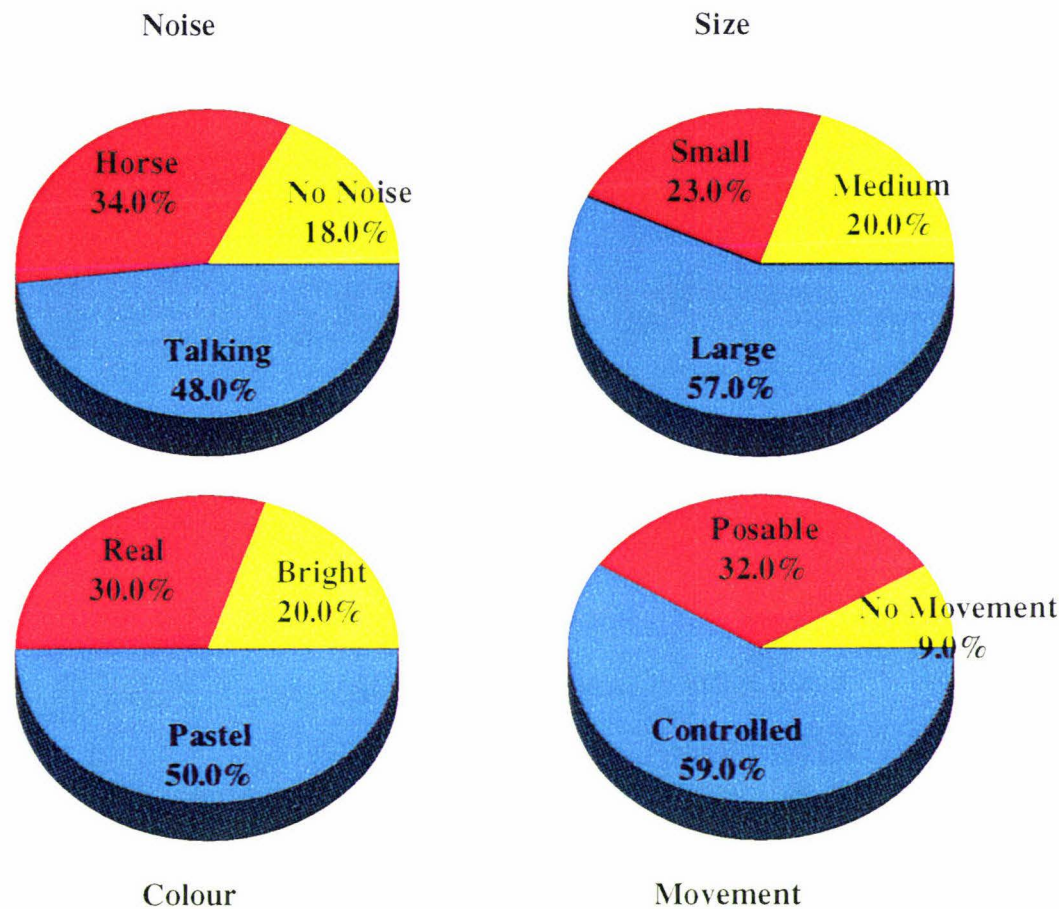


Figure 8.3: Distribution of Preferred Levels of Attributes for "Pony Dolls" using Conjoint Analysis

The Conjoint Analysis Programme then compared the importance of the four attributes, Figure 8.4. This showed the attributes in order of decreasing importance to be movement, size, colour and noise. The movement of the horse was the most important attribute in terms of determining preference, with the

controlled movement as the most preferred level.

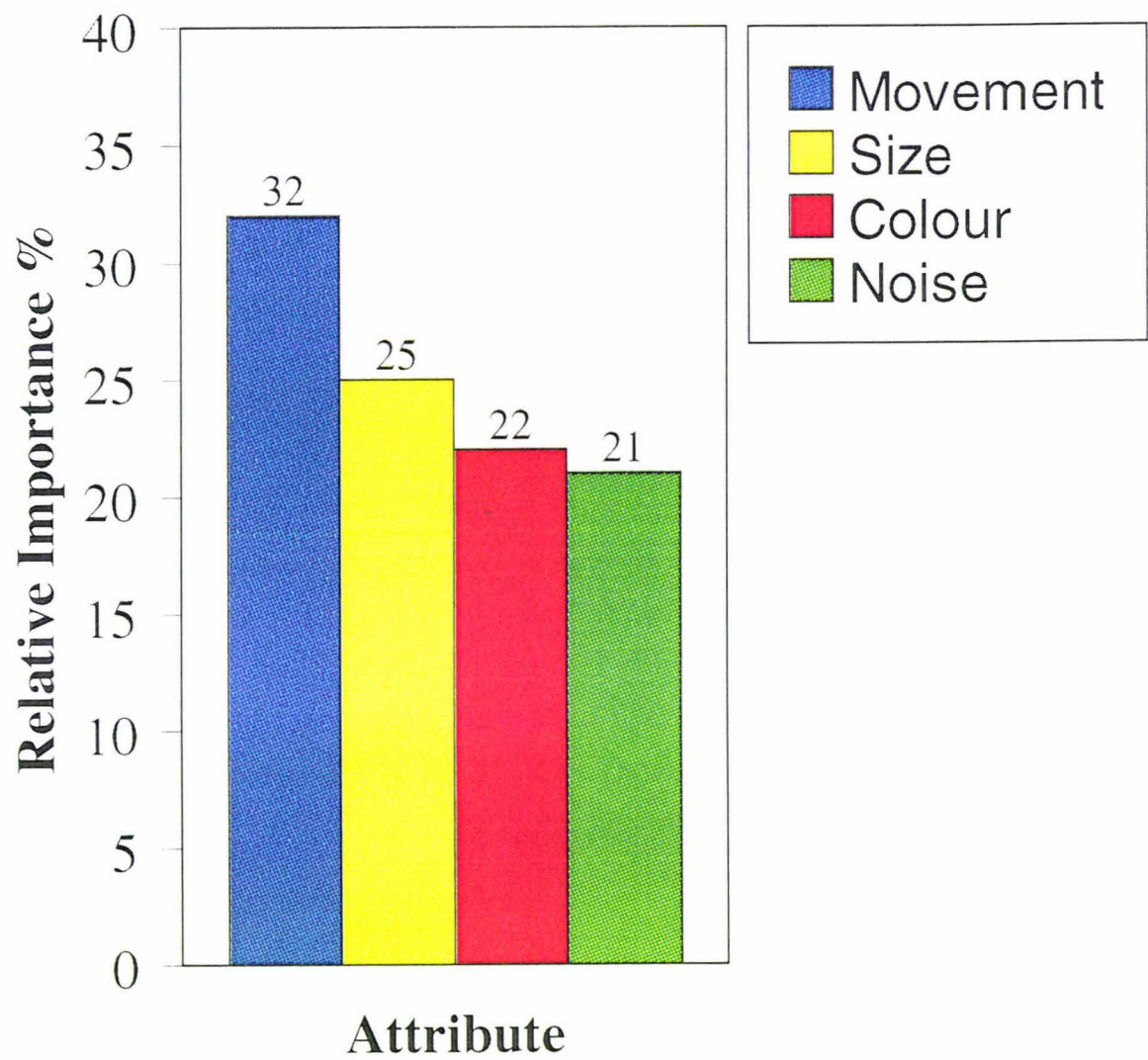


Figure 8.4: Relative Importance of Attributes for "Pony Dolls" using Conjoint Analysis

Figure 8.5 shows the utilities within the attributes for the "Pony dolls" where the total for the levels must equal zero within each attribute. The larger the utility

the more preferred the level is by the consumer. For example, a talking horse is more preferred to a horse that makes horse noises which, in turn, is more preferred to a horse that makes no noise.

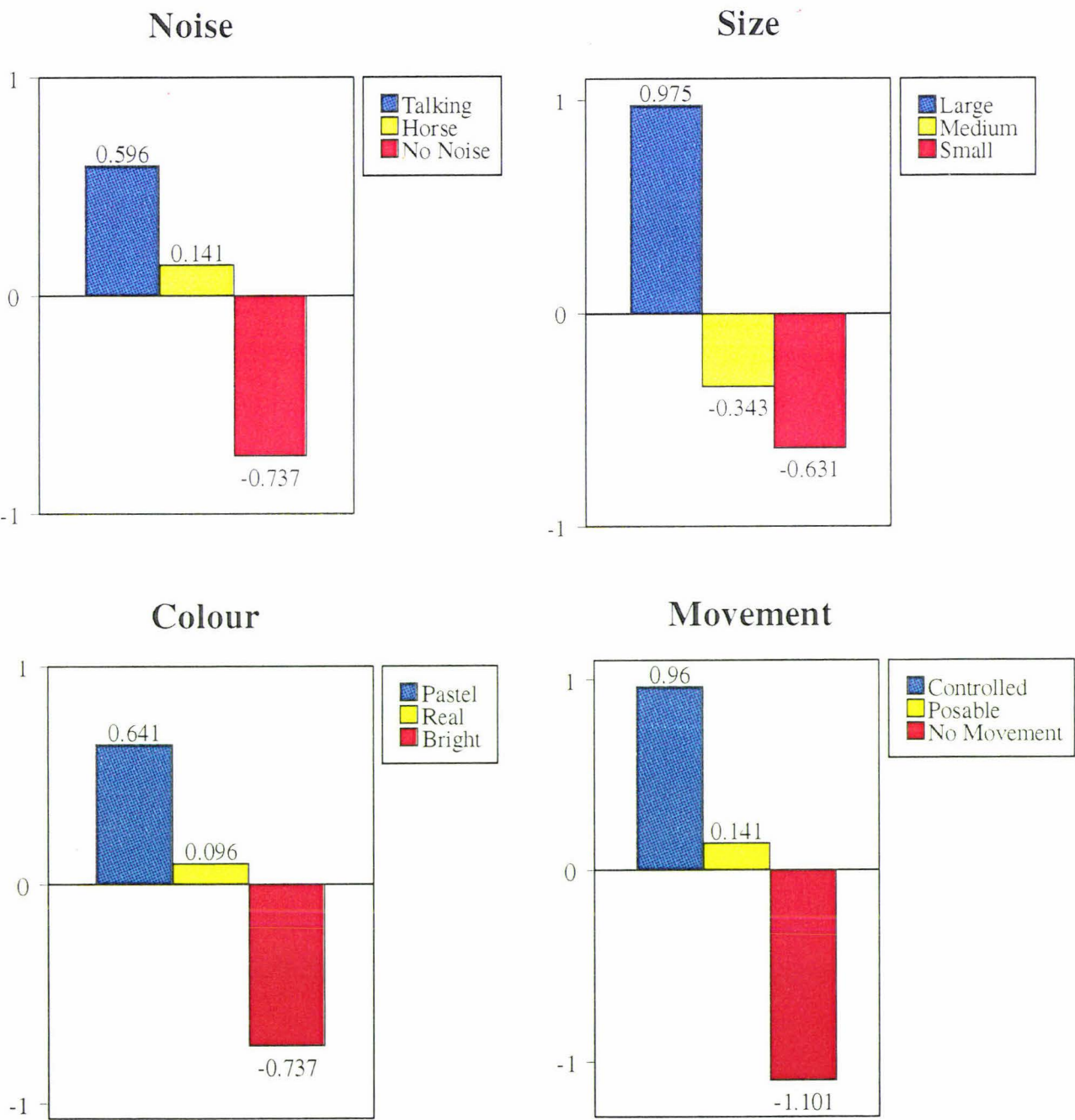


Figure 8.5: Utilities of Levels within the Attributes for "Pony Dolls" using Conjoint Analysis

When the predicted scores using the "holdout" combinations were compared with the actual scores, a total of 44 pairs (22 children with 2 "holdout" combinations), the correlation obtained was 0.41. Compared to the Spearman Test Statistic which gave a value of 0.39 at a level of significance of $p < 0.05$, there was a significant correlation between the predicted and the actual results. Therefore the data collected from the children was reliable.

8.7 Evaluation of the Product Concept Development Techniques used with the Children

The children experienced some difficulty with the two tasks that were asked of them in this stage of the project. No literature was found where researchers had used Conjoint Analysis with children so it is not possible to compare the results of this research with others. Only twenty two of the children managed to complete the Conjoint Analysis. Eleven cards were obviously too many for them to handle. This problem may have been overcome for some of the children if sketches, instead of written concepts, were used but for many it was simply they did not have the skills to sort into order the number of products presented. The six year olds had a lot of difficulty with this task. They would have found both the reading of the concepts and putting them in order difficult due to their level of cognitive development. However the correlation between the predicted and actual results using the "holdout" combinations showed the children that were able to complete the task produced valid and reliable data. Care would need to be taken when using this technique that the children were at a suitable level of cognitive development to handle the sorting required.

The ranking activity was not handled as competently as they had been in previous sessions even though the children had had a lot of practice with this technique by this stage of the project. The performance of the children could have been affected by the Conjoint Analysis, which was completed first. The ability to choose and order a number of products was the main cause of failure to

complete the questionnaire properly. It is important to put checks into the questionnaires so as to be able to identify children with difficulty with the technique. It is noticeable that the largest number having difficulty was in the six year old age group which was to be expected as many of them would not have reached the stage in cognitive development required to complete this task reliably every time.

8.8 Discussion of Product Concept Development of "Pony Dolls"

Two important points were raised by this part of the project. Firstly the importance of getting the mixture of attributes in a product correct. The children obviously found many attributes of the "paradise horse" appealing but unfortunately did not like the orange body colour; this caused the horse to score much lower than would have been predicted in terms of preference and prettiness. The orange colour obviously had more of an effect on score for prettiness than it did on preference causing the horse to change position fifth equal for preference to seventh equal (last) for prettiness. Care needs to be taken when developing products to identify all the important attributes, not just some, and to get all of them correct from the consumer's point of view if the product is to be a success.

As far as the children were concerned prettiness did not just describe appearance as it would with adults but was an indication of overall preference. It covered other attributes of the product including in this case ability or not to make noise, type of hair and clothes as well as size and colour. The children did not differentiate between prettiness and preference when ranking the products or when giving reasons for choices of products for prettiness and preference. However the example of the "Paradise horse" showed that visual appearance does have a greater effect on prettiness than it does on preference

8.9 Conclusion

This stage of the project was the most difficult. The younger children, six year olds, and some of the seven year olds had problems handling the exercise to provide the data for the conjoint analysis. This was due to the large number of cards that had to read and ordered. The difficulty they had in putting items in order also surfaced to some extent in the questionnaires but because the number of products required to be ordered was smaller, more of the children were able to complete it. However those children that could complete the exercises produced valid data. The key to obtaining valid data is to be able to identify and remove the data, from the sample for analysis, of the children having difficulties.

The following five product concepts were developed by the children, using the conjoint analysis program, for testing in the last stage of the project.

Concept A

A talking horse large enough to sit on, in pale colours, with controls to move its head and legs.

Concept B

A posable, talking, horse in pale colours the size of the large toy.

Concept C

A horse large enough to sit on in pale colours that makes a noise like a real horse. It can move its head and legs using controls.

Concept D

A large toy sized talking horse that is pale in colour. It can move its head and legs using controls.

Concept E

A large toy sized horse that makes a real horse noise and is a real horse colour. It can move its head and legs using controls.

Chapter 9

Product Concept Testing By Children

9.1 Introduction

The last session of the Small Group Study involved Product Concept Testing and this stage had a two fold purpose; firstly, to test suitable techniques for evaluating the concepts the children had developed; secondly, to check if the process of developing these concepts had been successful. The latter was assessed by determining whether the new product concepts were more popular with the children than the present products on the market. Two techniques were used to obtain information for this final stage of the project. Multidimensional Scaling was used to place the two new concepts in amongst popular products presently on the market. A simple Preference Ranking Test was used to determine the acceptance of the concepts to the children.

9.2 Defreezing

By this stage in the project the children involved had become very comfortable with the Product Development Process and with meeting as a group with the researcher. The defreezing time in this session was spent discussing what the children would do for their August Holidays that were about to begin. The presentation of the results of the Product Concept Development session were also part of the defreezing process and a discussion was held. The children were particularly interested in the Conjoint Analysis which had been simply described to them in the Product Concept Development session. They wanted to know what the computer had "said".

9.3 Multidimensional Scaling

The technique of Multidimensional Scaling was used to see how the new concepts that had been developed by the children related to their favourite pony dolls from the concept development session. Two written concepts, "Horse 1" and "Horse 2", were displayed along with the three most popular pony dolls from the previous session - "Purple Talking Pony", "White Pony", and the "Brown and White Noise Pony". To represent the group of less popular products, the "Ballet Pony" was added. It was chosen as it was considered to be the closest to a "Princess Type Pony" (Horse 2) of the ponies tested (Figure 9.1). The concept for "Horse 1" was generated by Conjoint Analysis and was the concept that was predicted to be the most popular by the Conjoint Analysis program. "Horse 2" was a concept constructed out of the most preferred attributes identified in the screening stage of the project (see Table 7.2).

The two written concepts were:

Horse 1

This horse is very large. It is large enough for you to sit on. The horse can talk to you if you push a button. It comes in pale colours like purple, blue, pink and yellow. This horse can move its legs and head using some controls on the top of the horse.

Horse 2

This is a very pretty horse. It has long hair and comes with make-up that you can put on the horse. It has a beautiful saddle and jewels (earrings, rings and a crown). This horse looks like a princess.



(Left to right) Top: White Pony and Brown/White Noise Pony. Bottom: Ballet Pony and Purple Talking Horse

Figure 9.1: "Pony Dolls" used for Multidimensional Scaling

The product concepts were written in thirty point, times roman font and printed onto an A4 sheet (Appendix 9.1). The written product concepts and commercial products were presented, in turn, as pairs and the children were then asked to circle a number on a Numerical Scale to indicate how similar they thought the ponies were that were described or shown (Appendix 9.2). The answer form was printed in sixteen point times roman font with each concept or product name written, in full, in pairs beside each scale.

This information was then analysed using the MDS programme KYST-PC . The data from the children was converted to means before using it in the MDS program (Appendix 9.3). Appendix 9.4 gives the data file used in the computer analysis.

9.4 Preference Test

The Preference Test was conducted in three parts. The female children were presented with three combinations of concepts and/or products in sets of five, one at a time, and asked to choose the "Pony Doll" they liked the best or to put them into order of preference.

The three sets of concepts are summarised in Table 9.1. The concepts were given more than one letter so that the children would see the three tests as separate and make them read each concept each time rather than just choosing the letter they had chosen before.

Table 9.1 "Pony Doll" Product Concepts

Concept	Size	Noise	Attribute Colour	Movement	Pretty	Accessories	Princess	Hair
A/F/P	Large	Talk	Pale	Controls	-	-	-	-
B	Small	Talk	Pale	Posable	-	-	-	-
C	Large	Horse	Pale	Controls	-	-	-	-
D	Small	Talk	Pale	Controls	-	-	-	-
E	Small	Horse	Natural	Controls	-	-	-	-
G/R	-	-	-	-	Yes	Yes	Yes	Long
H/T	Large	Talk	Pale	Controls	Yes	Yes	-	-
I	Commercial Product (Purple Talking Pony)							
J	Commercial Product (Brown/White Noise Pony)							
Q/J	Small	Horse	Natural	None	-	-	-	-
S/I	Small	Talk	Pale	None	-	-	-	Long

All these concepts were printed in large font (30 point, times roman) and printed on A4 sheets of paper. An example is found in Appendix 9.5. The concepts were read out loud in turn, taking one set at a time and then the children each chose the one they liked the best. With the first set of five concepts they also put them in order of preference in order to provide a way of screening the children for validity. A questionnaire sheet was used by the children to record their choices (Appendix 9.6).

9.4.1 Product Concepts from Conjoint Analysis

The first set of concepts tested contained five concepts, A to E, obtained from the Conjoint Analysis, and were tested in order to compare the predicted results for preference calculated by the Conjoint Programme (Chapter 8) with actual results obtained from the children. Two sets of data were collected for this purpose. The children firstly, chose the concept they liked the best and also put the five concepts into order of preference. The five concepts were;

Concept A

This horse is large enough to sit on. It can talk. It comes in pale colours like purple, blue, pink and yellow. It can move using controls on the top of the horse.

Concept B

This horse is the size of a toy horse. It can talk and comes in pale colours like purple, blue, pink and yellow. You can put its legs and head in different positions when you play with it.

Concept C

This horse is large enough to sit on. It makes noises like a real horse and comes in pale colours like purple, blue, pink and yellow. It can move using controls on the top of the horse.

Concept D

This horse is the size of a toy horse. It can talk and comes in pale colours like purple, blue, pink and yellow. It can move using a set of controls on the top of the horse.

Concept E

This horse is the size of a normal toy horse. It is the colour of a real horse and sounds like a real horse. You can make it move using controls on the top of the horse.

9.4.2 New Product Concepts Developed from "Liked" Attributes and Conjoint Analysis Compared with Commercial Products

Three concepts were evaluated along with two popular commercial products from the marketplace, to make a total of five items. The two commercial products were the "Purple Talking Pony" (Product I, Figure 9.2) and the "Brown and White Noise Pony" (Product J, Figure 9.3). These were used along with the following three written concepts, F, G and H. "Concept F" was generated using Conjoint Analysis and is the same as "Concept A". "Concept G" was constructed using popular attributes from the Product Idea Screening

and "Concept H" was a combination of information from Conjoint Analysis and popular attributes.

Concept F

This horse is very large. It is large enough for you to sit on. The horse can talk to you if you push a button. It comes in pale colours like purple, blue, pink and yellow. This horse can move its legs and head using some controls on the top of the horse

Concept G

This is a very pretty horse. It has long hair and comes with make-up that you can put on the horse. It has a beautiful saddle and jewels (earrings, rings and a crown). This horse looks like a princess.

Concept H

This horse is large enough to sit on. It is pretty with long hair. The horse comes in pale colours such a pink, purple, yellow and blue. It has jewels and make-up. You can make the horse move using controls. This horse can talk.



Figure 9.2: Product I-"Purple Talking Pony"



Figure 9.3: Product J-"Brown and White Noise Pony"

9.4.3 New Product Concepts Developed from "Liked" Attributes and Conjoint Analysis Compared with Written Descriptions of Commercial Products

The same three written concepts were tested, as before, (F, G and H) but instead of using the two commercial products, Product I and Product J were replaced with written descriptions. The three written concepts were relabelled as "Concept P" (Concept F), "Concept R" (Concept G) and "Concept T" (Concept H). Products I and J were given the following written descriptions:

Concept Q (Product J)

This small, pretty horse does not move. It looks like a real horse and is brown and white in colour. It makes noises like a real horse.

Concept S (Product I)

This horse is purple in colour. It has long hair and can talk. It is small and its legs and head do not move. It is pretty.

An MDS computer program KYST-PC was used to calculate the spatial configuration of the six products in up to five dimensions, that is dimensions one, two, three, four and five. The plot of stress versus dimension diagram (Appendix 9.7) shows that the appropriate number of dimensions to consider was two as any further dimensions did not decrease the stress significantly. At two dimensions the stress was 0.007. The history of the computation is in Appendix 9.8 showing the working of the computer program.

The goodness of fit of the model to the data was good, as indicated by the Dist(d) and Dhat(-) versus Data diagram (Appendix 9.9), as there was clearly a positive linear gradient.

9.5.2 Multidimensional Scaling Configuration Plot Results

Table 9.3 gives the dimension values and the spatial configuration plot for the six products, in Figure 9.4 shows the placement of the products in 2 dimensions.

Table 9.3 Multidimensional Scaling Configuration Plot Dimension Data

Final Configuration			
Pony Dolls	Dimension 1	Pony Dolls	Dimension 2
D Ballet Pony	-0.693	E Horse 1	1.149
F Horse 2	-0.673	A Purple Talking Pony	0.331
A Purple Talking Pony	-0.663	C White Pony	-0.147
E Horse 1	-0.182	B Brown/White Noise Pony	-0.179
B Brown/White Noise Pony	1.081	D Ballet Pony	-0.535
C White Pony	1.128	F Horse 2	-0.620

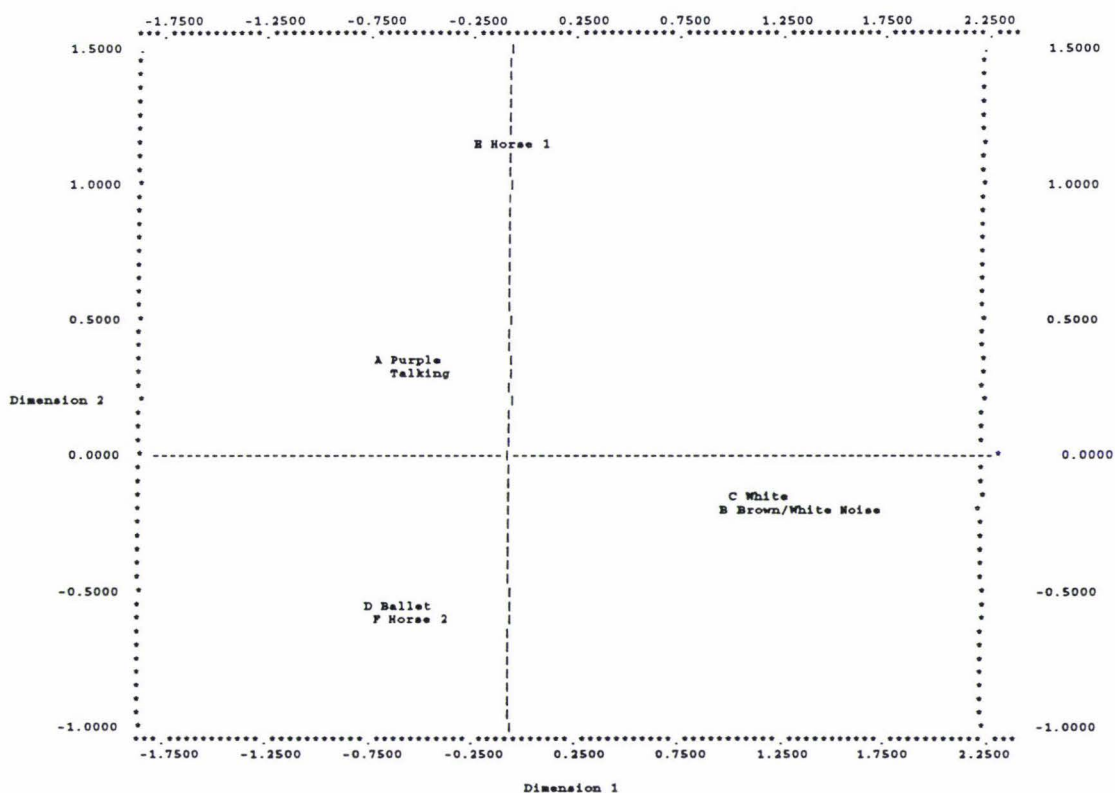


Figure 9.4: Multidimensional Space for Product Concepts and Commercial Products

In the first instance, the plot appeared to have validity based on knowledge of the researcher about the products. If Dimension 1 (x axis) is examined the "White Pony" and the "Brown and White Noise Pony" are grouped together and they look the same. They both look like real horses rather than the "Little Pony" style. The "Ballet Pony" "Horse 2", Horse 1 and "Purple Talking Pony" were also grouped together. The "Ballet Pony" and the "Purple Talking Pony" are both from the "Little Pony" brand and therefore would be seen by the children as being similar. "Horse 2" is a written description of a "Princess Type Pony", with clothes and accessories, which would suit the "Little Pony" image, while "Horse 1" is coloured the same as the "Little Pony" products, being in pastel colours, and so is likely to be visualised by the children as a "Little Pony" product.

Dimension 2 (y axis) gives the "White Pony" and the "Brown and White Noise Pony" still grouped together as are the "Ballet pony" and "Horse 2". The "Purple Talking pony" and "Horse 1" are on their own in the upper half of the plot. This makes this Dimension 2 (y axis) a little more difficult to label.

9.5.3 Labels for the Dimensions

Deciding on labels for the dimensions is one of the most difficult tasks when using Multidimensional Scaling. It is made more difficult when the technique is used by children and the labels are decided on by an adult. Unfortunately, there was not time to go back to the children and ask them for their ideas on what the dimensions represented, which would have been the preferred method.

Dimension One on the x axis appears to be the "realness" of the pony, that is how life-like they are. A suggested scale would be from "not life-like" to "life-like". The "Ballet Pony" being the least "life-like" and the "White Pony" the most "life-like". The two concepts being tested scored such that "Horse 2" was considered less life like than "Horse 1". An examination of the descriptions of these two concepts would show this result to be feasible.

The label for Dimension Two on the y axis is less clear. It appears to be prettiness based on the relative positions of the four commercial products that have been measured for prettiness in Chapter 8. That is, the "Purple Talking Pony" being most pretty and the "Ballet Pony" least pretty. Therefore the scale could be from "pretty" to "not pretty". As prettiness has already been shown to represent preference this leads to the conclusion that "Horse 1" is more preferred than "Horse 2". As "Horse 2" has the word pretty in the concept description it may seem to be an anomaly that "Horse 2" has been placed as the least pretty pony. This may be because of the presence of the "Ballet Pony" which the children have already scored low on prettiness. They may have formed a picture of "Horse 2" which was similar to the "Ballet Pony" and therefore scored it the same.

9.6 Preference Ranking the Product Concepts

A total of thirty-eight children completed the preference ranking. Forms were removed from the analysis on the basis of an inability to complete the order of preference activity correctly, as had been carried out with other preference tests. This meant the removal of the data from 2 six year olds, 3 seven year olds and 1 eight year old. This left a sample of thirty-two questionnaires for analysis composed of 11 six year olds, 9 seven year olds and 12 eight year olds.

9.6.1 Testing of New Product Concepts Generated by Conjoint Analysis

In order to test the accuracy of the development of the concepts using Conjoint Analysis the children were asked to choose the concept they liked best from the five concepts developed using the conjoint programme. They also put the five concepts in order of preference to give two sets of data for comparison. Table 9.4 gives the single choice scores for each concept. These were converted into percentages to compare them with the predicted scores from the Conjoint Analysis programme.

Table 9.4 Most Preferred Product Concept from Product Concepts A to E from a Single Choice

Concept	Age Groups			Total	Percentage	Order
	Six	Seven	Eight			
E	6	2	6	14	44%	1st
A	2	4	2	8	25%	2nd
C	2	2	2	6	19%	3rd
B	1	1	1	3	9%	4th
D	0	0	1	1	3%	5th
Total Number of Children	11	9	12	32	100%	

If the data from the six year olds are removed from this analysis because their data was not included in the Conjoint Analysis and therefore did not have an effect on the predictive results, the first preference choices of the five concepts are as in Table 9.5.

Table 9.5 Most Preferred Concept from Concepts A to E from a Single Choice for Seven and Eight year olds

Concept	Totals	Percentage	Order
E	8	38%	1st
A	6	29%	2nd
C	4	19%	3rd
B	2	9%	4th
D	1	5%	5th
Total Number of Children	21	100%	

It should be noted that the overall order of preference the five concepts does not change but the difference in percentage between first and second place is reduced from 19% to 9% when the data from the six year olds is removed.

The children then put the five concepts into order of preference. The main aim of this was to check validity of the data. If the children failed to put the concept they chose in the first part as the first concept in their order of preference the data for that child was removed from the analysis. The results from the remaining thirty-two children were analysed to see if they provided a better correlation with the predicted results than the single choice. The total preference scores by allocating 1 for the least preferred product concept through to 5 for the most preferred product concept and summing this data for each product concept (Table 9.6).

Table 9.6 Order of Preference for Product Concepts A to E

Concepts	Total Preference Scores	Percentage of Total Preference Scores	Age Groups			Overall
			Six	Seven	Eight	
E	111	23%	1st	3rd	1st	1st
A	103	21%	3rd	1st	3rd	2nd=
C	102	21%	2nd	2nd	2nd	2nd=
D	89	19%	4th	4th	4th	4th
B	75	16%	5th	5th	5th	5th
Total	480	100%				

Note (1) Total Preference Scores calculated by allocating to each product concept a score to represent the ranked given by the child and summing for all the children
 1 = least preferred 5 = Most preferred

As with the single preference scores the data for the order of preference was recalculated with the data from the six year olds removed leaving twenty-one children (Table 9.7).

Table 9.7 Order of Preference for Product Concepts A to E for Seven and Eight year olds

Concepts	Total Preference Scores	Percentage of Total Preference Scores	Overall
E	71	23%	1st=
A	71	23%	1st=
C	68	21%	3rd
D	58	18%	4th
B	47	15%	5th
Total	315	100%	

Note (1) Total Preference Scores calculated by allocating to each product concept a score to represent the ranked given by the child and summing for all the children
 1 = least preferred 5 = Most preferred

Examination of the testing of the Conjoint Analysis generated product concepts showed that the most preferred concept when the seven and eight year old children were given a single choice was "Concept E" (38%) but when they put the five product concepts into order of preference there was a tie

between "Concepts A" and "E" (23%). "Concept A" is also the same as "Horse 1" tested in the Multidimensional Scaling.

Concept A

This horse is large enough to sit on. It can talk. It comes in pale colours like purple, blue, pink and yellow. It can move using controls on the top of the horse.

Concept E

This horse is the size of a normal toy horse. It is the colour of a real horse and sounds like a real horse. You can make it move using controls on the top of the horse.

It had been predicted by the Conjoint Analysis program (Chapter 8), using the First Choice Model, that "Concept A" (34%) would have been the most preferred followed by "Concept E" (27%). On balance it seems that "Concept E" is most preferred. The only attribute that is at the same level is movement. For the other three attributes "Concept A" is composed of the most preferred levels for each attribute and "Concept E" is composed of all the second choice levels for each attribute. Movement was the most important attribute (32%) and both of the product concepts had controlled movement which was the most preferred level (59%). "Concept A" it is large enough to sit on it, "Concept E" it is small, ie normal pony doll size. Size had a relative importance of 25% making it the second most important factor, while large and small had level utility scores of 57% and 23% respectively. Noise had a relative importance of 21% while talking (present in "Concept A") rated at 48% against real horse noise at 34% in "Concept E". Lastly colour at 22% with pastel colours present in "Concept A" (50%) and real horse colour in "Concept E" with a level utility score of 30%.

The Conjoint Analysis program gives two sets of predicted results calculated in different ways either; using a first choice (winner takes all) model or a probability model. These predicted results were compared to the two sets of actual results obtained from a single choice and from placing the concepts in

order of preference. Table 9.8 gives the percentage scores of each of the concepts predicted by the Conjoint Analysis programme or by calculating the percentage of children that chose each of the concepts by each method.

Table 9.8 Comparison of Predicted Preference Scores from the Conjoint Analysis with Actual Data for Seven and Eight Year Olds

Concept	Predicted Results First Choice	Predicted Results Probability Model	Actual Results Single Choice	Actual Results Order of Pref
A	34%	24%	29%(25%)	23%(21%)
B	9%	18%	9%(9%)	15%(16%)
C	18%	22%	19%(19%)	21%(21%)
D	11%	20%	5%(3%)	18%(19%)
E	27%	16%	38%(44%)	23%(23%)
Totals	100%	100%	100%(100%)	100%(100%)

Note (1) Number in parentheses are for the analysis with the data including the six year olds.

To test the reliability of the predicted models correlation coefficients were determined using the Minitab statistical program to obtain the coefficients contained in Table 9.9.

Table 9.9: Correlations between Predicted Preference Scores from Conjoint Analysis and Actual Data from Preference Testing

	Actual Results Single Choice	Actual Results Order of Preference
Predicted Results First Choice	0.876* (0.761)	0.991* (0.765)
Predicted Results Probability model	-0.092 (-0.278)	0.274 (0.060)

Note (1) Number in parentheses are for the analysis with the six year olds included
 (2) * Significant when compared to the Spearman Test Statistic of 0.8000 when n = 4 and P<0.05

Two correlations were significant. They were the correlations between the single choice data from the seven and eight year olds and the predicted data using the first choice model, and the order of preference data from the seven and eight year olds and the predicted data calculated using a first choice model. Data including the six year olds did not give a significant correlation with the predicted data as would be expected. The probability model produced by the Conjoint Analysis Program did not prove a good predictor for any of the data collected.

9.6.2 *Testing of New Product Concepts Compared with two Popular Products in the Market Place*

"Concepts/Products F" to "J" were tested by presenting the children with the three written concepts and the two commercial pony dolls. The results of this test are shown in Table 9.10.

Table 9.10 Most Preferred Product Concept from a Single Choice for Three Written Concepts and Two Commercial Products: Concepts F to J

Concept	Age Groups			Total	Percentage	Order
	Six	Seven	Eight			
J	7	3	4	14	44%	1st
H	0	4	2	6	19%	2nd
I	1	1	3	5	16%	3rd
G	3	0	1	4	12%	4th
F	0	1	2	3	9%	5th
Total Number of Children	11	9	12	32	100%	

The testing of this set of written concepts and 2 commercial products gave a clear preference (44%, 14 of the 32 children) for "Product J" which was the small "Brown and White Noise Pony". This is interesting because "Product J"

is the same as "Concept E" which was preferred by the children when the concepts generated by Conjoint Analysis were tested.

In order to test the effect of the presence of the commercial products the concepts were tested a second time as "Concepts P" to "T" but the two products were presented as written descriptions rather than real products. This data is contained in Table 9.11.

Table 9.11 Most Preferred Product Concept from a Single Choice for Three Written Concepts and Two Written Descriptions of Commercial Products: Concepts P to T

Concept	Age Groups			Total	Percentage	Order
	Six	Seven	Eight			
R	5	3	4	12	37%	1st
P	3	0	5	8	25%	2nd
Q	3	2	0	5	16%	3rd=
S	0	4	1	5	16%	3rd=
T	0	0	2	2	6%	5th
Total Children	11	9	12	32	100%	

This set of concepts/product descriptions gave a different result with the most popular concept being "Concept R" (37%) which was the concept generated from preferred attributes. "Concept R" is also the same as Horse 2 tested in the Multidimensional Scaling

Concept R

This is a very pretty horse. It has long hair and comes with make-up that you can put on the horse. It has a beautiful saddle and jewels (earrings, rings and a crown). This horse looks like a princess

Table 9.12 gives the comparisons of results for "Concepts F" to "J" and "P" to "T", with the identical concepts/products shown in pairs.

Table 9.12: Comparison of Preference Data for Concepts F to J and P to T

	Concepts F to J	Concepts P to T
Concept F/Concept P	9%(3)	25%(8)
Concept G/Concept R	12%(4)	37%(12)
Commercial Product I/Written Description S	16%(5)	16%(5)
Concept H/Concept T	19%(6)	6%(2)
Commercial Product J/Written Description Q	44%(14)	16%(5)
Total	100%(32)	100%(32)

Note (1) Numbers in parentheses are the number of children that chose the concept.

A correlation was performed using Minitab giving a value of -0.396 clearly showing no correlation between the two sets of results. The only difference between the two sets of data is that in one set (Concepts F to J) two commercial products are being tested with three written concepts while in "Concepts P" to "T" the commercial products were replaced with written descriptions. "Concepts P" to "T" have produced results that are more consistent with what would have been expected based on the previous work in the study, but as stated before, the most preferred concept from "Concepts F" to "J "compares well the most preferred concept from the Conjoint Analysis.

9.7 Evaluation of the Product Concept Testing Techniques for use with Children

37 of the 38 children that attempted the Multidimensional Scaling were successful in completing all the scales, however, an unexpected problem did

develop. The researcher was unaware that the children equated the word "same" with the word "identical". In mathematics they are asked to put together items of the same shape or colour into a set which has the same meaning as identical. The choice of the word "same" for the scales was therefore inappropriate.

The children commented that the Multidimensional Scaling scoring sheet was boring so care must be taken to limit the number of products being tested. They did not appear to have any difficulty understanding the concept of what was required in terms of the test. The data produced appeared to be valid. However a better choice of wording may have produced a clearer outcome.

Bahn (1986) used Multidimensional Scaling when he looked at brand perceptions and preferences of cereals and beverages. He found a difference between the children at different stages of cognitive development and felt that the children at the concrete operational (nominally all the children in this study) were able to handle the task and provide consistent judgements over time as well as a greater level of brand discrimination than the pre-operational children.

The children quite easily handled the, by now familiar, mechanisms of the Preference Test but once again the odd child did not manage to handle the ranking question. The significant correlations obtained between the predicted results from the Conjoint Analysis Program and the actual results for the seven and eight year olds at a significance of $p < 0.05$ showed that the older children (7 and 8 years) could be consistent in their preferences for products. This result supported the worth of the Conjoint Analysis technique for the development of concepts with the older children.

To investigate the effect of the presence of the commercial products instead of the written descriptions an analysis was carried out on whether the children chose the same first choice of concept when presented with the two

real toys or all written concepts, Table 9.13. It was the seven year olds that were most influenced by the presence of the real toys in the concept testing, not the six year olds as would have been expected. Nearly all the seven year olds, two-thirds of the eight year olds and only half of the six year olds changed their choice of most preferred product when presented with the second set of concepts.

Table 9.13 Effect of Inclusion of Real Products instead of Written Product Descriptions in Concept Test

	Six Years	Seven Years	Eight Years	Total Children
<i>Concepts/Commercial Products F to J</i>				
Chose a Commercial Product	8	4	7	19(59%)
Chose a Concept	3	5	5	13(41%)
Total Number of Children	11	9	12	32(100%)
<i>Concepts/Written Descriptions P to T</i>				
Chose Commercial Product Written Description	3	6	1	10(31%)
Chose a Concept	8	3	11	22(69%)
Total Number of Children	11	9	12	32(100%)
Commercial Product and correct written description	3	1	1	5(26%)
Commercial Product and incorrect written description	5	3	6	14(73%)
Total Number of Children	8	4	7	19(100%)
Chose 2 concepts the same	3	0	3	6(46%)
Chose two different concepts	0	5	2	7(54%)
Total Number of Children	3	5	5	13(100%)

This tends to indicate that the presence of the commercial products had an effect on the choices the children made. 59% of the children chose one of the commercial products when presented with a mixture of concepts and commercial products and only 31% chose the commercial products when they were presented as written descriptions. Whereas 46% of the children chose the same concepts twice only 26% chose the correct description to match the commercial product they had chosen the first time.

It would be interesting to retest the concepts as prototypes with the two commercial products and see if the same order of preference was produced for "Concepts P" to "T" when they were all in a three dimensional form.

9.8 Discussion on Product Concept Testing of Pony Dolls

The concept testing was the final stage of this project. The purpose was to evaluate product concept testing techniques and to determine if the concepts developed by the children were preferred above products presently available on the market. Unfortunately the data was not clear enough to reach a strong conclusion on this.

Examination of the Multidimensional Scaling plot placed the two product concepts being tested relative to the four commercial products. The position of these two product concepts appears to be valid based on the positions of the commercial products. The children perceived "Horse 1" and "Horse 2" to be in the "Little Pony" type category in terms of realness. If Dimension 2 is prettiness then "Horse 1" is more pretty than "Horse 2" and therefore more preferred. This information would be useful if the project was to be continued in terms of branding and marketing the products.

The preference test used to confirm the predictive value of the Conjoint Analysis was in part successful. A significant correlation was found between

the actual and predicted data using the first choice method. The concepts preferred by the children were "Concept E" which was predicted as second choice followed by "Concept A" which was predicted as first choice. These ponies are quite different and further work would be required to confirm the correct direction to proceed with the development of these products.

The information obtained from the two further Preference Rankings was interesting. The testing using the concepts and the commercial products gave a preference for the "Brown and White Noise Pony" and this was also preferred by the children based on the data collected when the Conjoint Analysis was evaluated. The testing of the concepts and written descriptions gives a different picture and most preferred product is concept developed by putting together all the "most like" attributes. This concept was for a pretty princess pony with long hair make-up and pretty clothes and accessories (for a horse). Prettiness has already been determined as important and based on a knowledge of how children play with these products the long hair and accessories you can put on and off would all contribute to making this product attractive to the children. Products like this are available under the "Little Pony" brand name however these particular combination on one product was not.

9.9 Conclusion

It was difficult to assess the Multidimensional Scaling technique with the children. It would be interesting to see the effect of a better choice of scale labels to remove the problem of the word "same" meaning "identical" to the children. However the placement of the products in the configuration plot appears to be sensible, but the difficulty naming the axis shows the need to return to the group once the data has been processed to confirm the axis names. The Multidimensional Scaling produced a two dimensional diagram

and while it was not possible to confirm, through testing the two attributes of measurement appear to be prettiness and realness.

The results of the Preference Test were also not as clear as expected. The fact that there is no correlation between the scoring for the two sets of concepts, (Concepts F to J and Concepts P to T) that are the same products but in different forms, does give cause for concern, unless the factor or factors can be identified that caused the changes in preference. The fact of the effect of the presence of commercial products versus the written descriptions is the most likely explanation. The correlation between the actual results and the predicted results from the Conjoint Analysis program was a good indication that the children are consistent in their preferences in this case.

No clear direction in terms of which product to develop further was obtained and had time allowed one further test including the two commercial products and "Concepts R" "A" and "E" would have been conducted to obtain better direction.

Chapter 10

Discussion and Conclusions

10.1 Introduction

This project had two aims, which were; to develop techniques to incorporate ethical standards into Product Development Projects involving young children and, to test techniques with young children suitable for the first stage of the Product Development Process from Product Idea Generation to the Product Concept for the design. This project was a very preliminary study which investigated the first stage of the Product Development Process and the place of average child consumers as active participants that could contribute usefully to the development of a new product.

The incorporation of ethical standards proved to be a challenging part of the project and resulted in activities to achieve this becoming an integral part of the project.

Screening is an important issue when dealing with children. From an ethics point of view it is desirable to have no screening but some screening is required on a small scale to eliminate those children that can not manage the techniques.

Various consumer techniques were tried with the children with varying success. This discussion will look at the modifications made to the techniques, how successful they were, and areas for further investigation. While having suitable consumer research techniques is important, many other areas affect the performance of the children and their ability to contribute useful, consistent and valid information for the development of product concepts.

The toys used in this research will be discussed and the results of the Product Development Process in terms of the development of a new toy. Lastly further

work that can be conducted to develop the techniques and the process to use with the children.

10.2 Ethical Issues

The examination of suitable ways of incorporating ethical standards in the project was carried out in consultation with the Massey University Human Ethics Committee, Teachers, the Principal and the Board of Trustees at the school and used the guidelines set down by the Marketing Research Society of New Zealand. This process resulted in, repeated chances for the children to withdraw from the project, the development of a detailed reporting process to the different participants in the project; the children, the children's caregivers and teachers, a motivation system that rewarded participation rather than quality of work produced and the removal of any form of screening of the children before the activities began.

Screening of the female children was not carried out as this may have proved harmful to those children that were screened from the programme. The children may have been able to determine that children had been screened because they had failed to perform a task correctly and this could have lead to a lowering of self esteem in the child or ridicule by the other children, either of which would have been unacceptable from an ethics point of view. At all times the needs of the child must be put first as no consumer research project is more important than the well being of a small child.

The main ethical issues to consider when working with children is that they are not to be exploited or made to suffer either socially, psychologically or intellectually due to participation in the research.

10.2.1 Avoiding Exploitation of Children during Consumer Research

Children can be exploited in two ways. They can feel, because the research is being run by an adult, that they must continue to participate in the programme even though they may no longer wish to do so. Secondly they can be deprived of information on the research because it is difficult to share the results and other information with them in a meaningful manner. They are participants and therefore have a right to know what is going on no matter how hard it may be for researchers to convey information to them.

The measures put in place in order to protect the children from exploitation proved, on the whole, to be successful. The right to refuse participation was explained each time they were collected from class, at the start of each session and before each individual activity. Teachers and caregivers also had the right to remove a child from the project at any time. One child that felt uncomfortable during the Small Group Study attend two sessions fully, left one session early and refused to attend another session. She was a child (according to her teacher) that was very hesitant in trying new activities in case she performed badly. No other children appeared to be unhappy during the sessions and it is hoped that they all felt they could leave at any time if they had wished.

The progress of the research was reported to, and discussed with, the children at the start of each session. All the data was reported in such a way that no individuals could be identified. The reports and discussions were included in the sessions as an integral part of the defreezing process and required a considerable amount of preparation to analyse the data and prepare results in a form that could be usefully discussed by the children. The children gained a lot from the reporting sessions and it proved to be a good method of getting their thoughts back onto the project. The caregivers were given access to information through the newsletters, informal discussions with their children, that many caregivers reported occurred, and at the meeting at the end of the Small Group Study. One area that did require improvement was the

communication with the teachers. Although a regular meeting with the principal was held during the project to discuss the progress and preliminary findings, the teacher group did not receive good information on the project on a regular basis. This should have been formalised through a regular meeting. The teachers were also unable to attend the end of project meeting due to teaching commitments.

10.2.2 Considering Ethics when Motivating Child Participants

Motivation of participants is important to achieve success in a consumer research project. When choosing a scheme to motivate children it was necessary to consider any psychological harm that could be caused. Any method that involved a competitive element was not acceptable. To ensure that the children did not suffer care was taken to treat all the children's work as if it was of equal standard. Some difficulties arose from this procedure as the children wanted to know who was the best and were clearly confused as to why the researcher did not appear to be able to tell the difference between a good drawing and a bad one, or a good story and a poor one. By the end of the project they had stopped asking for this type of input from the researcher but amongst themselves they gave ratings to their work. It is difficult to avoid this need for comparison unless the children work as individuals. The process of rating themselves against others is well ingrained by the time they are six, as was obvious from these children. The very fact that their work was not praised for its skill may have been in fact upsetting to some children, who normally performed well in a school environment, as it was normal school practice to reward good work.

Individual praise for good work was not used to motivate the children so they were motivated to participate by a certificate and stickers. Children of this age collect things, a fact well known by fast food outlets such as MacDonalds and Georgie Pie that use sets of collectable toys to encourage children to eat in their stores weekly to obtain all the toys in a particular set. This was a most simple

but effective method as it encouraged the children to attend all four sessions to obtain all four stickers.

10.3 Screening of Children for Product Development

Screening of the children was not allowed as part of the recommendations of the Massey University Human Ethics Committee. The comments of the committee were valid, in that those female children that would have been excluded could have been hurt. All the children that wished to participate were included in the project. This resulted in a 100% participation rate of those children that were offered the opportunity in the Group Introduction, by virtue of being members of the classes involved in the project. In the case of the Small Group Study all the female children were asked to participate and this too resulted in a 100% acceptance rate.

The inability to screen did not pose a problem for the research in the Group Introduction as the purpose was to conduct a class activity. However it did cause problems for the Small Group Study. There were some children in the study that consistently failed to complete the tasks in a competent manner and the exclusion of this small number of children from the project would have been helpful. In order to be able to screen the children safely it would have been necessary to draw the children from a much larger pool so that it would be difficult for the children to be aware of their reason for exclusion. As an added protection the final choice should be carried out by ballot from a pool of suitable children and therefore the reason for exclusion of the children without the necessary skills would be hidden.

Younkin's, 1989, paper on screening states that to obtain very creative children a large amount of screening is required. However to identify very creative adult consumers also requires a detailed screening procedure. The purpose of this research was to obtain the opinions of the average child consumer in much

the same way as the average adult consumer contributes to the development of new products for their use. Detailed and involved screening procedures are not desirable if companies are to be encouraged to include the opinions of children in their Product Development Process. Executing complex screening procedures are beyond the talents and the commercial constraints of all but specialised market research companies. As many manufacturing companies in New Zealand are small, having to go to such lengths to include appropriate children in their Product Development Programmes, as described in Younkin (1989), would act as a strong deterrent to companies without the required skills or resources to conduct the procedures and maintain the panels. However, if very creative work is required then creative people are needed no matter what age, screening is necessary and panels such as Younkin (1989) uses are very appropriate for this situation.

This research showed, however, that screening of children before inclusion in a consumer research project is desirable in two areas; age screening and screening for basic reading and writing skills at an average level for their age. All the children under the age of six failed to complete the activities correctly and their data had to be removed in all occasions where quantitative work was required. The age of six was also defined as the minimum by many other workers in this area (Wells, 1965; Coutrot and de la Beaumelle, 1978; Elliot, 1979; Baum, 1980; Grabner, 1980; Mayes, 1980; Greenbaum, 1988; McDonald and Topper, 1988; Riecken and Yavas, 1989; Kroll, 1990; Guber and Berry, 1983). Children under the age of six do not have the cognitive, literacy or social skills to perform the consumer techniques developed for use with adults even if they are modified in some way. Children below the age of six require more specialised techniques to be used in order to obtain appropriate information for product development which is supported by Neelankavil et al. (1985) who have developed a specialised technique for use with younger children. Guber and Berry (1983) suggest the use of "Friendship Pairs" or "Mini Groups" for the younger children instead of using larger Focus Groups.

The second group of children are those that do not have the reading and writing skills that are average for a child of their particular age. These children had difficulty with the techniques tested in this research also and their data was often screened before analysis. Any child over the age of six is a suitable candidate for participation in Product Development, however, it would be advisable to carry out a screening procedure to remove any children that do not read or write at a level average for their age group. If it is very important to obtain data from these two groups of children then special techniques must, and should, be used to obtain useful and valid information from them.

A complaint often made about consumer research with children is that they are inconsistent, unreliable and the data obtained from them is not valid and is of no real use for all the effort. They are most likely being inconsistent because they do not understand what is being asked of them rather than the fact that they have no firm opinion. By building in checking mechanisms into the project you are able to clean up the data. Does this detract from the idea of using average consumers? When working with adults you would remove from the data a questionnaire that was not completed correctly or fully. Often adults are self screening because an adult that did not have good reading or evaluative skills is unlikely to volunteer themselves for a consumer research programme. All that was done in this research was to recognise the limitations of the group involved and removing data belonging to those children that could not understand what was expected of them. This meant asking the same question in a couple of different ways without letting the child know you are checking up on them (Cocks and Adams, 1978).

A method used in this research proved most successful. The children were asked to identify the one product they liked the most and then asked to pick five and put them into order. If the first product in their order was not the same as the product they chose when they had a single choice they obviously had not understood what was being asked. Observation of the children

working is also most important as you can identify those children that may be having difficulty so their data can be examined later.

This area of checking the data for validity and consistency before analysis was not found in the literature. It was an important part of this project because the children were not screened before hand. If the children had been screened, as described before, most of this checking would likely not have been necessary. It is interesting to note however that while in most cases it was the same group of children that were removed each time there was a small number of children that failed to complete successfully one activity only. In some cases they had been successful with the same type of activity previously in the project. A simple check is may prove to be useful even with children that have been screened to enable the researcher to remove the data from a child giving a poor performance on the day. Children do get tired, and reading, writing and putting items in order are all newly mastered activities for them. They have days when they do produce consistent data. This is a bit like when you first learn to drive a car you still have days when you crunch the gears and forget the road rules no matter how hard you try.

This screening is not an excuse for the wholesale removal of data that does not suit the researcher or developers' liking. Only data that shows clear evidence that the child has not understood the activity or mastered the mechanics of the exercise should be removed.

10.4 Consumer Techniques for use with Children in Small Groups

Various consumer techniques were used with the children to move through the Product Development Process from Product Idea Generation to Final Product Concept. Some of these were modified from the way they are used with adult consumers (Table 10.1).

Table 10.1 Modifications to Consumer Techniques

Technique	Modifications	Skills Required
Focus Groups	Allowed toys to be used during the session Shortened time	Verbal communication and descriptive skills Ability to sit still
Projective Techniques	No special features	Drawing and Writing
Attribute Screening	Used coloured cards Played "Post Box Game"	Reading 1/2 word attributes Sorting attributes according to opinion
Idea Screening	Female Smiley Scale Word Scale using child language Personalisation of the scales	Reading Descriptions Allocating a value for preference
Conjoint Analysis	Coloured cards to sort the concepts "Going into Corners Game"	Reading Concepts Sorting into order of preference
Multidimensional Scaling	No special features	Reading concepts Using a seven point numerical scale
Preference Testing	Items given letters	Reading concepts Order of preference

10.4.1 Focus Groups

The Focus Group technique was modified only slightly. The children were allowed to bring toys with them to use during the session to aid in their explanations (McDonald and Topper, 1988) and the time was very much shorter than an adult group. The Focus Groups only lasted just over ten minutes each. This is an extremely short time and an increase in age did not produce a corresponding increase in the length of the Focus Group time. A large amount of data was collected in this short space of time and it would be interesting to see if an increase in the time would actually produce new material or whether, because the children use fewer attributes than adults when assessing products that all the important data can be collected in quite a short space of time. A Focus Group is similar to discussions normally conducted in a school class room

except the teacher would normally take a stronger leadership role in a classroom discussion situation. The children however easily adapted to the researcher being a moderator rather than a discussion leader, as a teacher would be and they performed well in the group situation and contributed a useful information on the toys. This work supported the findings of Greenbaum, 1988; McDonald and Topper, 1988; Driggs and Mihm, 1990; Jenkins and Harrison, 1990; and Guber and Berry, 1993; who all found focus group work to be successful with children. Elliot (1979) preferred the matched pairs technique which was not tested by this researcher but the problems Elliot (1979) found with focus groups, of low response rates and dominant child affects were not evident in this research.

10.4.2 Projective Techniques

The projective techniques of drawing a picture and writing a story are ideal techniques for use with children and were handled well by all the children. The children were able to clearly express what attributes the doll should have and also develop complete ideas for new products using these methods. Projective techniques are well recognised methods to enable children to communicate their wants and needs in new products (Grabner, 1980; Gordon and Langmaid, 1988, Greenbaum, 1988; and McDonald and Topper, 1988; Guber and Berry, 1993). The difficulty is in the interpretation, particularly if projective drawing is used. The combination of the letter and the drawing on the same topic made it much easier for the researcher to interpret the work the children had done. Discussion with the children could have been a little more thorough but it was difficult in a group situation as each child needed to be talked to individually. In this research the information the children were conveying was quite clear.

10.4.3 Product Attribute Screening

The screening of product attributes was achieved using coloured cards for each attribute and "Post boxes" to represent the feeling the children had about each attribute. While each child could be identified by the colour of the cards they were using it was not really possible to check the validity of the data. It was

not clear which children had difficulty with the task, if any. Some of the children would have had difficulty with reading the cards, and were assisted by the researcher, but no check was in place to identify these children. On the whole they enjoyed the "Post Box Game" and it was felt that the data produced was valid. Gordon and Langmaid (1988) are advocates for using cards to enable children to sort or categorise a number of items. It allowed them to handle more attributes as they were physically able to put them into categories, rather than having to do it on paper. It was also easy to turn into a game for the children which made it much more fun than just writing numbers on a sheet. The idea of turning techniques, wherever possible, into games is also suggested by Gordon and Langmaid (1988).

10.4.4 Product Idea Screening

Hedonic scales were used to screen complete product ideas, either a female Smiley Face Scale or a Word Scale using language well known to the children. Half the children used a Smiley Face Scale and the other half used a Word Scale. Kroll (1990) showed that with self-administered forms the five to seven year olds children did not perform better with the Smiley Face Scale than with the P&K and Hedonic Scales. This study also showed no significant difference between the data produced by the two scales with the children. Wells, in 1965, had asserted that Face Scales were most appropriate. Since then, the recognition of children's language has meant that Word Scales can be used as effectively if the choice of scale labels is made carefully. While the data was not effected by the choice of scale the children enjoyed the Smiley Face Scale more. This was evident by their comments and a keenness to personalise their forms by colouring in the scales. This keenness to personalise their work was also noted by Schoenfeld (1990). The Smiley Face Scale, or similar, could be an advantage if the children were confronted with a large number scales to deal with in one session as the ability to be able to colour them in and so on could be used to prevent boredom.

Specialised scales such as the Audio Visual Children's Scale (Lebender, 1978) were not evaluated in this project. While the scales tested produced adequate data it is easy to see how a scale such as the Audio Visual Children's Scale would appeal to children. With the development of Multimedia computers it would be easy to produce such a scale that could be self administered by the child. The main disadvantage of this scale would still remain the time it takes for all the options to be shown, but it would introduce a fun aspect with the use of a computer which would prevent boredom if a lot of products or concepts were tested.

10.4.5 Conjoint Analysis

The Conjoint Analysis Technique was modified to include; a preliminary discussion with the children about each card so they understood what they were sorting, a game element, the children ran off into their own corners sorted the concepts (cards) and ran back with the answers, and the concepts were on cards so they could be put in order and then the order transferred to the answer sheet.

Conjoint Analysis did not prove to be successful with the six year old group, but the significant correlations between the preference scores predicted and actual data collected from the older children showed some success. The children had to sort eleven written concepts into order of preference, which was beyond the capabilities of most of the six year olds and even some of the older children had difficulty with the requirements of the data collection procedure. The inclusion of sketches rather than, or as well as, written concepts may have improved the process. However the fact that eleven cards were required to test the four attributes created a problem as this was too many for some of the children to handle no matter what the presentation of the concepts was. The children that were able to perform the activity produced valid data as was proved at the Concept Testing Stage when there was a significant correlation between the results predicted by the Conjoint Analysis Programme and the actual results produced by the children.

No literature was found on the use of Conjoint Analysis with children and from this study it is possible to say that it can be used with children, but the technique needs some modification. It may not be a suitable technique for children under the age of seven but this depends on whether it was the presentation of the concepts in a written form or the number of concepts the required ranking that caused the younger children most difficulty. If it was the former, then modifications made to the presentation of the concepts so that they are in a graphic or model form may improve the input of the younger children.

10.4.6 Multidimensional Scaling

No modification was made to the Multidimensional Scaling Technique. However, the scales were produced in large font and the number of products/concepts was kept to six (two written product concepts and four commercial products) producing 15 scales.

The wrong choice of labels for the scale created problems as the children equated the word "Same" as meaning identical. This highlighted the need to check on wording for scales to be used with children before conducting a test. The children handled the scales well although the six products/concepts being tested created a large number of scales for them to deal with and an increase in the number of products/concepts may have overloaded them. They commented that the test was boring because of all the scales they had to do. On examination of the configuration plot the products seemed to have been placed within the plot in a sensible manner indicating that the children were producing valid data. This technique may have been improved by the presence of graphic as well as or rather than written descriptions or even simple models, but it did show that concepts can be tested in the written form.

Bahn (1986) found Multi Dimensional Scaling a suitable technique for use with children but he showed that the younger children (four and five years) used less attributes and were less consistent. This difference between the ages of the children was not tested in this research but the children did only use two

attributes to place the products. However this research supported that the children could handle the Multidimensional Scaling technique.

10.4.7 Product Ranking and Preference

Getting the children to rank or chose according to preference was used many times during the research on attributes, concepts or products. In all cases the children were ask to choose the product or concept they liked the best rather than whether they liked an individual product or concept or, they were asked to put a group of products or concepts in order of preference. This use of comparative testing rather than monadic is supported by Schwenter (1978).

Where possible they were given items on individual cards to rank or only a small number of items to deal with. The items were always given letters or numbers so they were not hindered by not being able to spell the name or describe the concept. Only one set of concepts or products were ranked at one time, rather than giving a number of sets at once for them to work through, to prevent confusion. Ranking was also a way of checking that the children were being consistent as discussed in the previous screening section (Section 10.3).

10.5 Organising the Product Development Process with Children

As was stated at the beginning of the project it is the little details that matter when conducting consumer research with children. Keeping the children interested in the project is most important. Adults can quickly lose interest in something is if proves very difficult to master. If barriers can be removed and the children feel like they are achieving something then the chances are their interest will remain high. The right environment, use of appropriate language, large print and line spaces so there are few words to the page, fun activities at times during the sessions, making the children feel important and comfortable, and communicating with them at their level, not below or above it will all produce better data in the long run. The findings of this research confirms that

of other workers in the area (Wells, 1965; Elliot 1979; Mayes, 1980; Schleier, 1985; Fraley 1987; Gordon and Langmaid, 1988; Greenbaum 1988; Younkin, 1989; Jenkins and Harrison, 1990; Kroll, 1990).

10.5.1 Research Environment

The study was conducted in a New Zealand state primary school (children aged 5 to 10 years). The children in New Zealand schools are encouraged to be creative through stories and art work, contribute to class discussions, work as groups or as an individual while sitting in a group setting. All these factors contributed to making them good candidates for participation in consumer research in a school setting.

In deciding on the research environment care was taken to ensure that the child was comfortable. The project work was carried out in a classroom, all furniture was geared to the size of the child and it was a situation with which they were totally familiar. The researcher always sat at their level and joined in all activities. This approach is also recommended by other researchers (Fraley, 1987; Gordon and Langmaid, 1988; Greenbaum, 1988; Marney, 1991; Guber and Berry, 1993).

No caregivers were present during the sessions as supported by Wells(1965) and Elliot (1979). Gordon and Langmaid (1988) stated that under the age of seven it is important to have a caregiver present. This may be so in a strange environment but as the children did not expect their caregivers to be with them during a normal school day their presence in this case would have caused confusion.

During the various stages of the project the children were encouraged to see the as fun, but to be taken seriously. In this way their interest in the project was kept high. (Greenbaum 1988). The products (toys) themselves helped to develop the fun aspect and the fact that the project was being run from the Massey University gave it an air of importance. This meant that the children

enjoyed being involved and also tried to perform at their best. If the product being tested did not have a fun element then extra activities may have needed to be added to give the children relief and a chance to play during the sessions. Items such as letters home on Massey letterhead, business cards, name badges and discussing the results also gave the project the correct air of importance to stop skylarking by the children. They had a good time and were very proud of their contribution to the project.

10.5.2 Group Introduction

The environment tested by this part of the study was classroom containing a complete class. The Group Introduction involved giving the children a questionnaire to complete in a normal class situation. This technique proved to be more successful with the female children than the male children. The incidence of failure to complete the questionnaire was much higher in the male children in all age groups. The activities in the questionnaire involved putting some products in order of preference, drawing a picture and writing a couple of sentences, giving reasons for preference of the products chosen. The modes of failure of the children were; an inability to put the products into order of preference and not finishing the questionnaire in the time allocated probably due to an inability to read or write at the level required. The reason for the marked difference in performance between the male and the female children is not clear further investigation is beyond the scope of this project. Before a firm statement can be made, this aspect of the project should be retested as a separate experiment to confirm that it is a true factor, the reason(s) for it and possible solutions in order to obtain better performance from the male children

In general the Group Introduction was a good method to obtain preliminary consumer information on products on the market and preferences. The children took the assignment seriously, copying was rare, although some collaboration did occur and comparison of answers at the end was common. They liked to see if they had produced something similar to their neighbour, when they were

not sure of the standard required, and they were genuinely interested in what other members of the class had done.

The Group Introduction phase took four hours to collect data from 91 children which was then followed by two hours of reporting back time. Discussing the results with the children gave them a chance to comment on the findings which served to reinforce that they were indeed valid, that is, they agreed with the findings. Allowing for analysis and some organisation/travelling time twelve hours total would see good preliminary consumer information collected from about 100 potential consumers at minimal cost in terms of money and staff effort. This data is then ready to guide a product development project. The Group Introduction could easily be used in other parts of the Product Development Process where less detailed specific consumer information is required. Such as deciding between the last two or three concepts or testing out the consumer acceptance of an almost final prototype.

There was no literature on involving complete classes or children in consumer research as a classroom activity. Work has been carried out in schools but the children were removed from the classroom individually or in groups to participate in the research, in much the same way as the second part of this project, the Small Group Study (Robertson and Rossiter, 1974; Robertson and Rossiter, 1976; Roedder John and Whitney, 1986).

10.5.3 Small Group Study

The Small Group Study was used to collect the more detailed development information required for the Product Development Process. Also conducted in a classroom the female children were in small groups (6 to 8 children). A classroom was convenient as the children wasted less school time getting to the group and did not need to leave the school grounds which kept it as a school activity under school control and therefore it can be conducted in school time. The classroom setting allowed "classroom rules" in terms of appropriate behaviour and ways of obtaining that behaviour. This was very useful when

giving instructions or changing activities as signals such as hand-up for silence could be used. The classroom setting is very familiar and put the children at ease rather than a strange environment which takes a little bit of adjusting to. Greenbaum, 1988, Gordon and Langmaid, 1988 and Marney 1991 support this idea that the environment should be familiar and comfortable for the child rather than convenient for the researcher.

Other researchers have carried out work with children in small groups (Fraley, 1987; Gordon and Langmaid, 1988; Greenbaum, 1988; MacDonald and Topper, 1988; Younkin, 1989; Driggs and Mihm, 1990; Jenkins and Harrison, 1990; Marney, 1991; Schoenfeld, 1991; Guber and Berry, 1993) and other have carried out their research with the children individually (Robertson and Rossiter 1974; Robertson and Rossiter 1976; Lebender, 1978; Roedder John and Whitney, 1986; Bahn, 1989; Riecken and Yavas, 1989; Kroll, 1990). Group work is a good way to get detailed information from the children but reduce the work load. The data from approximately forty female children was easily collected in about eight hours spread over a week for each stage of the project. To have collected the same material for each child individually would have taken between twenty-five and forty hours.

10.5.4 Presentation of Material

Elliot (1979), Mayes (1980) and Kroll (1990) have all shown that the use of language is important and a researcher should choose language that the children understand if clear communication is to be possible. In this project this was achieved by carefully listening to tapes of the children talking and reading their work to pick up appropriate language for scales and concepts. The children were also encouraged to give explanations to other children of what words meant, if that was necessary, so that it was in their own language rather than that of the researcher. However there were still some problems with language as highlighted by the wrong choice of word for the Multidimensional scale.

Other presentation issues such as large lines and fonts which enable the children to read and write more easily aid in the removal of barriers to the children communicating what they wanted to say. One page a time is also a good idea as they comment if confronted with a pile of paper as they see the amount of work as too much whereas if they are given the same sheets one at a time they manage with no problems.

10.6 Product Development of a New Toy

It was necessary, in order to test the First Stage of the Product Development with the children, to develop a toy. The children chose the toy they wished to work on and then as with a commercial situation the results of each stage were used to move the toy ideas through the process to a final concept. It was hoped that by the end of the process a concept would have been identified that could be further developed into a prototype. While it was the evaluation of the techniques that was the most important feature of the research the development of the product is worthy of a short discussion.

10.6.1 *Why use a Doll?*

At the beginning the researcher had dreams of working with something a little more "educational" than a doll. In fact many people commented through the course of the project that it was a very gender specific toy to choose. It was of course not chosen by the researcher but, overwhelmingly chosen by the female children as their preference of product to work with. The products chosen for the Group Introduction were seen a relatively unisex by the researcher but the data produced showed that while these toys may be played with by both male and female children when they are forced to choose or have ownership the toy categories are clearly split into male and female segments. This is supported by Guber and Berry (1993, p 71) who show in their table "Toys and Games Child Owns or Uses" that the majority have a gender bias. Large toy manufacturers

such as; Mattel, Hasbro and Kenner actively market toys according to gender (Guber and Berry, 1993).

The move from the "Sindy doll" to the "Pony doll" may, on the surface, look like a major change in product. However the common factor is the way the children play with these products. Guber and Berry (1993) state that the reason for "Barbie doll's" (similar to Sindy) success is that the doll is provided with enough accessories to stimulate the female child's imagination but not too restrictive that it dictates how the doll must be played with. "The doll is the prop on which young girls project their very private dreams" (Gruber and Berry, 1993, p 69) The female child plays in exactly the same way with the "Pony doll" as with the "Human doll". If you watch them the "Pony doll" will be treated very much as if it is a person. One of the most preferred concepts (Concept R) that the children developed is a good example of this. Concept R is a princess pony with lots of appropriate accessories to contribute to the "dream" or can be removed from the pony to play something else if that is required.

10.6.2 Development of the Product

The product was developed in four stages. Idea Generation produced a reasonable number of original ideas for new doll products and the attributes the children liked their dolls to have. The screening of the doll products was very clear with the "Pony Doll" being the most favoured and the preferred attributes of prettiness, long hair, make-up and a princess look being chosen. The "Pony Doll" idea was taken further in the Concept Development stage using the original description of the "Pony doll" to set the attributes for the Conjoint analysis. The "Pony Dolls already on the market were also investigated using ranking to determine if the same attributes as for "human dolls" applied. Lastly the concepts developed using either the conjoint analysis or preferred attributes from the attribute screening were tested against commercial products using Multidimensional Scaling and Preference Testing. It had been hoped that this would provide evidence that the whole process had been a great success. Unfortunately the results of this final testing stage were not clear. In a

commercial situation further testing could have been carried out to reach a conclusion but this was not possible in this case. However two original concepts developed by the children are still worth considering. The first is a pastel coloured talking pony that a child could sit on and move using some type of control system. The second product concept was made up of all the children's preferred attributes. It is a pretty horse with long hair make-up and accessories and looks like a princess. While it is not clear whether these two products were more preferred by the children than present commercial products. The second concept could easily added to the "Little Ponies" range of products as a line extension, and the first concept would probably be screened out by asking parents about the retail price they would be prepared to pay.

10.7 Further Work

It is much easier to say what has been found out rather than to identify what is left to do. But *from little acorns big oak trees grow* and this project was only a very preliminary study of this area of research.

The project has shown that generally the average child, above the age of six, can handle reliably the techniques that were tested. However, some evaluation of material given to the children could be undertaken. Most of the material in this research was in a written form, the easiest to produce, but would the inclusion of have graphics enhanced the quality of the data collected? Would illustrations rather than written concepts have improved the data collected for the conjoint analysis? Wording needs to be investigated as well. The problem with the word "same" used on the Multidimensional Scaling scales highlights how poor understanding by the researcher can hinder the children's ability to complete a technique correctly. The most important thing is to improve, by whatever means possible, the communication between the researcher and the child.

This project was only undertaken with a small group of female children. It is obvious that in order to say that the process works with "any average child" the testing would need to be widened to male children and children of various ethnic groups before any firm decision could be made about the true value of the process.

As well as improving the techniques that were tested there are many other techniques that could also be evaluated that are applicable to the first stage of the product development process. For example, different types of group discussions, such as nominal groups, various types of brainstorming techniques to aid with idea generation, and other kinds of scales can be evaluated for screening ideas and evaluation of concepts. Now that it is clear that the general process is possible it is necessary to determine the most suitable techniques to use. The actual techniques used in this project may not in fact be the best ones for use with children.

This research only studied the First Stage of the Product Development Process and future work can obviously be carried out in a similar way on other parts of the process to evaluate the contributions children can make.

In terms of the product itself the next step for this particular project would be to prototype the three popular product concepts involving children during the prototyping process and then test on a larger group of children for final acceptability. This would confirm that the process of obtaining the most preferred concepts was a valid one.

10.8 Conclusions

This project has shown, for the most part, that primary school children, do have opinions about products, they are consistent and able to be measured using slightly modified consumer research techniques that are already being used by

adults. With attention to detail children are able to contribute to the First Stage of the Product Development Process in much the same way as adults have done for many years. The Group Introduction was a good method to gather general information about a product area from a large number of consumers while the Small Group Study provided an environment to collect detailed data, opinions and ideas to guide the Product Development Process.

This process works in the New Zealand School system because the children have a high standard of literacy, they are use to working as groups or working as individuals in a group situation and they are use to creative project work from the start of their schooling. Whether this process could be moved successfully to another school culture would need to be evaluated.

New Zealand children from the age of six years with average reading and writing abilities are capable of participation in a Product Development project that requires the input from an average consumer. Detailed screening procedures to chose children with above average abilities is not necessary unless the project has special requirements such as particularly creative children. It must be recognised however, that some children may not be consistent in their performance over the course of the project or in certain activities and therefore it is wise to include a checking mechanism so that any data can be removed that is not valid before analysis.

There was a effect of gender identified with the female children of all age groups out performing the male children in the Group Introduction. This would need further testing to confirm. The gender differences also arose in the choice of toys with what appeared on the surface to be unisex toys actually being preferred by one gender or the other. This gender difference may be present in many other products that are considered by adults to be unisex

Care must be taken to consider the ethics of any aspects of the project when working with consumers, especially children, before the start of the project. It

is easier to build appropriate features into the project at the planning stage rather than having to incorporate them at a later date. Children can easily be hurt by events or comments and researchers must ensure that the participation in a voluntary programme of research is not an experience that could cause a child suffering in any way. For example, motivation techniques should not be competitive. If children are participants in the research then they have the same rights as adults in terms of; withdrawing from the project and access to the research and attempts must be made to convey information to them in a way that they can readily understand and allow them to do what they want to in terms of participation.

When modifying techniques for use with children there are three important considerations. Keeping their attention, which can be achieved by adding a game component to the technique and altering activities frequently. Limiting the size of the task, either in the length of time it will take to complete or the number of products or concepts that need to be dealt with by each child. Lastly ensuring good communication between the child and researcher is occurring. This is not just restricted to the use of appropriate language but also the mechanics of communication, such as, large spaces between answer lines so the children can write in their normal style and providing concepts on cards so they can sort first and write the answer later rather than combining the activities.

The research environment should be a place where the child feels comfortable with other features added to make the child realise the importance of the work they are undertaking rather than providing this feeling using a unfamiliar environment.

Regarding the product being developed, no conclusion can be reached regarding the concept that should be prototyped but three of the concepts ("R" "A" and "E") developed appear to have some merit.

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Appendix 3.1: Market Research Society of New Zealand Code of Marketing and Social Research Practice**MARKETING RESEARCH SOCIETY OF NEW ZEALAND
CODE OF MARKETING AND
SOCIAL RESEARCH PRACTICE****1. INTRODUCTION**

Effective two-way communication between producers, suppliers and consumers of goods and services of all kinds is vital to any modern society. Growing international links and interdependence reinforce this need. The supplier seeks to inform the consumer of what is available and where, using advertising and other forms of publicity to do so. In the other direction, the varied requirements of consumers must be made known to those who cater for their needs in both the private and public sector of the economy, and this increasingly calls for the use of research.

Marketing Research is concerned with analysing the markets for producers and services of all kinds. In particular it involves the systematic study of behaviour, beliefs and opinions of both individuals organisations. The measurement of public opinion on social, political and other issues has also long been linked with the field of marketing research. Although the subjects of study tend to differ, marketing research and social research have many interests, methods and problems in common. Both are involved with the analysis of new information, using the same or similar techniques. The issues dealt with in the Code apply to both fields of research.

In 1976 ESOMAR and the ICC adopted a single joint code which forms the basis of this Code of Practice.

This Code applies to all research projects, national or international, though practice must of course in all cases conform to the laws, legislation and legal practice of the country (or countries) concerned.

2. BASIC PRINCIPLES

Marketing and social research depend upon public confidence: confidence that the research is conducted professionally, honestly, objectively, without unwelcome intrusion and without disadvantage to survey respondents and that it is based upon the willing co-operation of the public.

The general public and anyone else interested shall be entitled to complete assurance that every research project is carried out strictly in accordance with

this Code, and that rights of privacy are respected. In particular, members of the general public must be assured absolutely that personal and/or confidential information supplied during the course of a research study will not be made available without their agreement to any individual or organisation, whether private or official, outside the researcher's own organisation, and that such confidential information will not be used for any purposes other than research.

Research should also be conducted according to accepted principles of fair competition, as generally understood and accepted, and to high professional and technical standards. Marketing and social researchers should always be prepared to make available the necessary information whereby the quality of their work and the validity of their findings can be adequately assessed.

Members should consider at all times that the purpose of market and social research is the collection and analysis of information, and not the direct creation of sales nor the influencing of the opinions of respondents. It is in this spirit that the Code has been devised.

3. DEFINITIONS

In this Code:

- (a) The term 'MARKETING RESEARCH' is defined as the systematic collection and objective recording, classification, analysis and presentation of data concerning the behaviour, needs, attitudes, opinions, motivations, etc., of persons and organisations (commercial enterprises, public bodies, etc) within the context of their economic, social, political and everyday activities. For the purposes of this Code, the term MARKETING RESEARCH is taken to cover also SOCIAL RESEARCH, insofar as the latter uses similar approaches and techniques in its study of issues and problems not directly connected with the marketing of goods and services. Reference to the term MARKETING RESEARCH shall throughout this Code therefore be held to include SOCIAL RESEARCH equally. The term also includes those forms of research commonly referred to as INDUSTRIAL MARKETING RESEARCH and as DESK RESEARCH, especially where these are concerned with the acquisition of original data from the field and not simply the secondary analysis of already available data.
- (b) The term 'RESEARCHER' is defined as any person, company, public or private organisation, which directly or indirectly conducts, or acts as a consultant in respect of, a MARKETING RESEARCH project or offers its services so to do. The term

RESEARCHER also includes any part of the same organisation as that of the CLIENT, and is further extended to cover the responsibility for the procedures followed by any SUB-CONTRACTOR from whom the RESEARCHER commissions any work forming only part of the research project; in such cases the RESEARCHER must take all reasonable steps to ensure that any such SUB-CONTRACTOR conforms fully with the provisions of this Code.

- (c) The term 'CLIENT' is defined as any person, company, group, public or private organisation (including any part of the same organisation as the RESEARCHER) which wholly or partly commissions, requests, authorises, or agrees to subscribe to a MARKETING RESEARCH project or proposes to so do.
- (d) The term 'RESPONDENT' is defined as any person, firm or organisation from whom any information is sought by the RESEARCHER for the purposes of a MARKETING RESEARCH project, regardless of the type of information sought or the method used to obtain it. The term RESPONDENT therefore covers not only cases where information is obtained by verbal methods, but also cases where non-verbal methods, such as observation, postal surveys, mechanical, electronic or other recording equipment, are used.
- (e) The term 'INTERVIEW' is defined as any form of direct or indirect contact (including observation, electro-mechanical techniques, etc) with RESPONDENTS the result of which is the acquisition of data or information which could be used in whole or part for the purposes of a given MARKETING RESEARCH project.

4. RULES

A. RESPONSIBILITIES TOWARDS RESPONDENTS

Article 1

Any statement made to secure co-operation and all assurances given to a Respondent, whether oral or written, shall be factually correct.

ANONYMITY OF RESPONDENTS

Article 2

Subject only to the provisions of Article 3, the Respondent shall remain entirely anonymous. No information which could be used to identify Respondents, either directly or indirectly, shall be revealed other than to research personnel within the Researcher's own organisation who require this

knowledge for the administration and checking of interviews, data processing, etc. The obligation is on the research organisation to take all practicable steps to ensure that no misuse of such knowledge occurs. All Respondents are entitled to be given full assurance on this matter.

Article 3

The only exceptions to the above Article 2 are as follows -

- (a) If Respondents have been told of the identity of the Client and the general purposes for which their names would be disclosed and have then consented to this disclosure;
- (b) Where disclosure of these names to a third party (e.g. a sub-contractor) is essential for data processing or in order to conduct further interviews with the same Respondents provided that the provisions of Article 4 are followed. In all such cases the Researcher responsible for the original survey must ensure that any third parties so involved, observe the provisions laid down in this Code;
- (c) Where the Respondent is supplying information not in a private capacity, but as an officer of an organisation of firm provided that the provisions of Article 5 are followed.

Article 4

With the exception noted below, further interviews within the context of a particular research project or survey with the same Respondents shall be carried out only if:

- (a) The Respondent's permission has already been obtained at a previous interview; or
- (b) It is pointed out to Respondents at the time they are re-contacted that this interview is consequent upon one they have previously given and they then give their permission before the collection of further data.

The only exception to this procedure is in the case where it is an essential feature of the research technique involved that Respondents do not realise that this further interview is consequent upon one they have previously given.

Article 5

If the Respondent is supplying information not in a private capacity but as an officer of an organisation or firm, then it may be desirable to list the Respondent's organisation in the report. The report shall not, however, enable any particular piece of information to be related to any particular organisation or person, except with prior permission from the relevant

Respondent, who shall be told of the extent to which it will be communicated. This requirement does not apply in the case of secondary analysis of published data.

RIGHTS OF THE RESPONDENT

Article 6

All reasonable precautions shall be taken to ensure that the Respondent, and others closely associated with the Respondent, are in no way adversely affected or embarrassed as a result of any interview. This requirement covers the information to be obtained, the interviewing process itself, and the handling and testing of any products involved in the research. The purpose of the enquiry shall be revealed in cases where information given in ignorance of this knowledge could adversely affect the Respondent.

Article 7

The Respondent's right to withdraw, or refuse to co-operate at any stage of the interview, shall be respected. Whatever the form of the interview, any or all of the information given by the Respondent must be destroyed without delay if the Respondent so requests. No procedure or technique which infringes this right shall be used. Respondents shall be told in advance where recording or filming techniques are to be used. This requirement does not apply where the actions or statements of individuals are recorded in public places and are normally liable to be observed and/or overheard by other people present.

In the latter case at least one of the following conditions shall be observed:

- (a) All reasonable precautions are taken to ensure that the individual's anonymity is preserved, and/or
- (b) The individual is told immediately after the event that his/her actions and/or statements have been recorded or filmed, and is given the opportunity to have the relevant part of the record destroyed or deleted.

Wherever questions are subsequently asked of the person observed, condition (b) above shall apply.

Article 8

The name of the research organisation conducting the interviewing shall be disclosed to all Respondents upon contact. In addition the business address and/or telephone number must be disclosed, if requested by the Respondent.

INTERVIEWING CHILDREN

Article 9

Special care shall be taken in interviewing children under 15 years. Before they are interviewed, or asked to complete a questionnaire, the permission of a parent, guardian, or other person currently responsible for them (such as the responsible teacher) should where practicable be obtained. In obtaining this permission, the Interviewer shall describe the nature of the interview in sufficient detail to enable the responsible person to reach an informed decision. The responsible person shall also be specifically informed if it is intended to ask the children to test any products or samples.

B. RELATIONS WITH THE GENERAL PUBLIC AND THE BUSINESS COMMUNITY

Article 10

No activity shall be deliberately or inadvertently mis-represented as Marketing Research. Specifically, the following activities shall in no way be associated, directly or by implication, with Marketing Research interviewing or activities.

- (a) Enquiries whose objectives are to obtain personal information about individuals per se, whether for legal, political, private or other purposes;
- (b) The compilation of lists, registers or data banks for any purposes which are not Marketing Research;
- (c) Industrial, commercial or any other form of espionage.
- (d) The acquisition of information for use by credit-rating or similar services;
- (e) Sales or promotional approaches to the Respondents;
- (f) The collection of debts;
- (g) Direct or indirect attempts to influence a Respondent's opinion or attitudes on any issue.

Article 11

Researchers shall not misrepresent themselves as having any qualifications, experiences, skills or access to facilities which they do not in fact possess.

Article 12

Researchers shall not publish or otherwise disseminate unjustified and unreasonable criticism of another member's work.

Article 13

Conclusions from a given research project or service that are inconsistent with or not warranted by the data shall not be knowingly disseminated.

C. THE MUTUAL RESPONSIBILITIES OF CLIENTS AND RESEARCHERS**Article 14**

The relationship between a Client and a Researcher will generally be subject to a form of contract between them.

This Code does not aim to limit the freedom of the parties to make whatever agreement they wish between themselves. However, any such agreement shall not depart from the requirements of this Code except in the cases of certain specific Articles, namely Articles 15-21 inclusive and 28. These are the only Articles which may be modified in this way by agreement between Client and Researcher.

PROPERTY OF MARKETING RESEARCH RECORDS**Article 15**

Marketing Research proposals and quotations provided by a Researcher at the request of a Client and without an agreed payment remain the property of the Researcher submitting them. In particular, prospective Clients shall not communicate the proposals of one Researcher to another Researcher except where the latter is acting directly as a Consultant to the Client on the project concerned; nor shall the Client use the proposals or quotations of one Researcher to influence the proposals of another Researcher. Similarly, the Marketing Research brief and specifications provided by a Client remain the property of the Client.

Article 16

The research findings and processed information from a Marketing Research project are the property of the Client. Unless the prior written consent of the Client has been obtained, no such findings or processed data shall be disclosed by the Researcher to any third party.

Article 17

The research techniques and methods used in a Marketing Research project do not become the property of the Client, who has no exclusive right to their use.

Article 18

All records prepared by the Researcher, other than the report, shall be the property of the Researcher. original Records may not be destroyed within two years after completion of the study without reference to the Client. Secondary Records on processing media may be destroyed at the discretion

of the Researcher when six months has elapsed since presentation of the findings.

Article 19

After the Researcher has submitted his report upon the study to the agreed specification, the Client shall be entitled to obtain from the Researcher duplicate copies of completed questionnaires or other Records, provided that the Client shall bear the reasonable cost of preparing such duplicates, and that the request is made within the time limit set by Article 18. Article 19 shall not apply in the case of a project or service which is developed by a Researcher and where it is clearly understood that the resulting reports are to be available for general purchase on a syndicated or subscription basis. Any duplicates provided shall not reveal the identity of Respondents.

CONFIDENTIALITY

Article 20

Unless authorised to do so by the Client, the Researcher shall not reveal to Respondents, nor to any other person not directly concerned with the work of the study, the name of the Client commissioning the study.

Article 21

All confidential information and material relating to the Client shall not be divulged except to persons wholly or substantially engaged in the service of the Researcher including sub-contractors, who need such information or material in order to effectively carry out the research work.

CLIENT'S RIGHTS TO INFORMATION ABOUT A PROJECT

Article 22

The Researcher shall clearly indicate to the Client which parts of a research project will be handled by sub-contractors. This does not apply to sub-contracting of a technical servicing nature e.g. printing, data processing services.

Article 23

On request the Client, or a Client's mutually acceptable representative, may attend a limited number of interviews to observe the standards of the fieldwork (the person then becomes subject to Section A of this Code). The Researcher is entitled to be recompensed if the Client's desire to attend an interview interferes with, delays or increases the cost of the fieldwork. In the case of a multiclient study, the Researcher may require that the observer in charge of checking the quality of the fieldwork is independent of any of the Clients.

Article 24

When two or more projects are combined in one interview, or one project is carried out on behalf of more than one Client, or a service is offered on the

basis that it is also available on subscription to other potential Clients, each Client concerned shall be informed of this fact in advance.

MULTICLIENT STUDIES

Article 25

The Client shall not give any of the results of a multiclient study to other potential purchasers of the study unless the Researcher's permission to do this has first been obtained.

PUBLISHING OF RESULTS

Article 26

Reports and other Records relevant to a Marketing Research project and provided by the Researcher shall normally be for use solely by the Client and the Client's consultants or advisers. Whether or not the copyright of the research findings is reserved to the Researcher in the Form of Contract for the project, if the Client intends any wider circulation of the results of a study either in whole or in part:

- (a) The Client shall agree in advance with the Researcher the exact form and contents of publication or circulation; if agreement on this cannot be reached between Client and Researcher the latter is entitled to refuse permission for his name to be quoted in connection with the study;
- (b) Where the results of a Marketing Research project are given any such wider circulation the Client must at the same time make available information listed under Article 31 about the published parts of the study. In default of this, the Researcher is entitled to supply this information to anyone receiving the above-mentioned results;
- (c) The Client shall do everything practicable to avoid the possibility of mis-interpretation or the quotation of the results out of their proper context.

Article 27

Researchers shall not allow their names to be used as an assurance that a particular Marketing Research project has been carried out in conformity with this Code unless they are fully satisfied that the project has in every respect been controlled according to the Code's requirements.

EXCLUSIVITY

Article 28

In the absence of any contractual agreement to the contrary the Client does not have the right to exclusive use of the Researcher's services, either in whole or in part.

D. REPORTING STANDARDS

Article 29

The Researcher shall, when presenting the results of a Marketing Research project (whether such presentation is oral, in writing or in any other form), make clear a distinction between the result themselves and the Researcher's interpretation of the data and the consequent recommendations.

Article 30

Normally every report of a Marketing Research project shall contain an explanation of the points listed under Article 31, or a reference to a readily available separate document containing this explanation. An exception to this Article is in the case where it is agreed in advance between the Client and the Researcher that it is unnecessary to include all the listed information in the formal report or other document. Any such agreement shall in no way remove the entitlement of the Client to receive any and all of the information freely upon request. Also this exception shall not apply in the case where any or all of the research report of findings are to be published or made available to recipients in addition to the original Client.

Article 31

The following information shall normally be included in a report on a research project:

Background

- (a) For whom, and by whom, the study was conducted;
- (b) The objectives of the study;
- (c) Names of sub-contractors and consultants performing any part of the research, excluding technical services, as defined in Article 22.

Sample

- (d) A description of the intended and actual universe covered;
- (e) The size, nature and geographical distribution of the sample, both planned and achieved;

- (f) Details of the sampling method and of any weighting methods and/or quota sampling used;
- (g) A statement of response rate, and where technically relevant a discussion of possible bias to non-response.

Data Collection

- (h) A description of the method by which the information was collected (that is, whether by personal interview, postal or telephone interview, group discussion, mechanical recording device, observation or some other method;
- (i) Adequate description of field staff, briefing and field quality control methods used;
- (j) The method recruitment used for Respondents and the general nature of any incentives offered to them to secure their co-operation.
- (k) The time at which the fieldwork was done.
- (l) In the case of 'Desk Research', a clear statement of the sources and their reliability.

Presentation of Results

- (m) The relevant factual findings obtained;
- (n) Bases of percentages, clearly indicating both weighted and unweighted bases;
- (o) General indications of the probable statistical margins of error, and where desirable the levels of statistical significance of differences between key figures;
- (p) A copy of the questionnaire(s) and other relevant documents used (or, in the case of a shared project that portion relating to the matter reported upon).

E. IMPLEMENTATION OF THE CODE

Article 32

Any person or organisations involved in, or associated with, a Marketing Research project and/or proposal is responsible for actively applying the Rules and this Code in the spirit as well as the letter. Breaches of the Code may result in membership being withdrawn by the National Council.

Appendix 3.2: Discussion Document for Teachers at West End School**PROPOSAL FOR RESEARCH WITH CHILDREN AT WEST END SCHOOL****INTRODUCTION**

The aim of this project is to develop some methods which can be used to collect information from children to create new product ideas for products that are used by them. For this piece of research the product type will be toys but the resultant methods will be applicable to many other products. The actual toy area has yet to be determined as it will be chosen by the children. Only a small amount of research has been carried out in this area, but it is becoming increasingly important as children become more active consumers.

As primary school teachers you have expertise that I need in order for my research to be successful. I am a Product Developer and I do not have expertise with children of this age group. I have prepared this document for discussion with you. You will see a number of questions that I have on my proposed project and I would be grateful for discussion on these and any other suggestions. It would also be good if you could act as consultants during my project. This should not be a big task, but a most important one to me.

PROJECT OVERVIEW

The project will be in 2 stages. The first stage is for the most part a selection procedure to decide which children will participate in the second stage. However the first stage is also an important piece of research on its own. The second stage is the main part of the project. Both these stages are described briefly below.

First stage

The first stage will enable selection of the children that are best suited to handle the main part of the project. All the children your classes will be involved in the following tasks.

- 1 The class will be shown 10 toys of different types and they will be asked to write down their best (most preferred) 5 in order of preference.
- 2 They will then be asked to draw a picture of their favourite toy at home and write a short story about it (about three lines).
- 3 There will be a short series of questions to fill out to see how they handle questionnaires.

Questions

How long should this activity take?

Is it within the capabilities of the children in your class?

Can you foresee any problems?

Do you have any suggestions?

2nd stage

The second will only involve those children that are selected. they will attend short sessions and complete the following activities.

1 Idea Generation

- Free idea discussion
- Observation analysis
- Projective techniques

2 Screening

- Checklists
- Rating scales
- Sorting

3 Concept Development

- Conjoint analysis/interview

4 Concept Testing

- Rating scales
- Discussion groups

TIME

The part of the project that effects the school is from approximately the middle of November to the end of February (excluding school holidays)

Questions

Is this a suitable time from the schools point of view?

What would be the best time of day to carry out the work with the children as complete classes?

What would be the best time of the day to work with the small groups?

Is it possible to remove them from class to do this work or would that be too disruptive?

CHILDREN'S INVOLVEMENT

The majority of children will only be involved in the first stage that is the selection procedure.

The rest of the project will only involve females, as I have a need to remove a variable from the research. 12 girls from each age group or class level (in groups of six) will need to participate in a number of activities in the following weeks. Each session will take between half an hour to an hour and each child will be involved in about nine sessions in total.

Questions

Is it better to use age or class level to choose the groups?

SELECTION OF THE PARTICIPANTS

This is where I will really need your assistance. I require a group of children that are capable in oral and written skills and also fairly social. Except for my brief contact with them in the class room and the work that they do in the first stage I will not have any other knowledge of them. I therefore propose that I prepare a short list of likely candidates and then go over this with the relevant class teacher to produce a final list.

Questions

Would this be the best way to select the girls?

Any other suggestions?

CONSENT

In the first instance the consent to carry out the first stage in the class room will come from you. Once the girls have been chosen then I will need to contact the parents of each child to ask their permission if the child indicates they would like to take part. At any stage during the project a parent or teacher can withdraw the child for any reason, or the child and stop if they do not want to continue. This work has been cleared by the Massey ethics committee.

Questions

What do you think of this method of obtaining consent?

Do you have any suggestions on improvement?

MOTIVATION

The girls that continue in the project will belong to a club (Teddy Bear Club) for the project's duration. At each session they will be rewarded with a small gift, as will each child in the classes that participate in the first stage.

Questions

Is this a good method of motivation for girls of this age?

Any other comments you wish to make on any aspects of my research would be most appreciated.

Carol Pound

Appendix 3.3: Submission to the Massey University Human Ethics Committee November 1991**MASSEY UNIVERSITY****HUMAN ETHICS COMMITTEE**

APPLICANT'S NAME: Carol Pound

DEPARTMENT: Consumer Technology
Technology Faculty

PROJECT STATUS: Masterate Thesis

SUPERVISOR'S NAME: A/Prof. Mary D. Earle

TITLE OF PROJECT: Obtaining ideas for new products from children

DESCRIPTION OF THE PROJECT:Aim

The aim of this project is to develop a series of techniques that will allow the use of children to complete the first stage of the Product Development Process. Female school children will participate in the following activities

- * generating ideas for new products
- * screening ideas
- * providing information to create idea product concepts
- * testing product concepts to find the most acceptable product to the children

Objectives

It is intended that the following objectives will be completed in order to satisfy the aim.

1. Selection of the toy area
This part of the study will be carried out in a classroom situation using approximately 100 children. The children will be asked to put in order of preference a selection of eight to ten toys. They will also be asked to write about their favourite toy and draw a picture of it.
2. Selection of participants
The selection of the female children to participate in this project will be based on their ability to handle the first task and by recommendation of their class teacher. Once a child has been selected then the parent or guardian will be contacted to obtain permission for the child to continue in the project.

3. Experimental Stage

The children will join a "club" (Teddy Bear Club) which will meet no more than once a week for about three months. This will meet at the school. At each meeting the children will carry out an activity and be rewarded at the end of it. The meetings will be for no longer than one hour, and in most cases will only be half an hour.

Procedures

The techniques being tested will be familiar to the children in that they will involve things they might do at school, for example, writing short stories putting items in order and so on. Many will appear to the children to be games, similar to those they may already play, for example, pretending to be someone else (role playing). Some of the activities will involve the children being video recorded or tape recorded during the session for analysis later. The type of techniques to be used are:

- * free idea discussion
- * observation while playing with toys
- * protective techniques; writing stories, drawing, role playing
- * sorting things in orders
- * scoring or rating of toys
- * interviews
- * discussion groups

Consent

The children will be asked if they would like to join the "club" and then consent will be obtained from one parent or guardian. The form and letter for this is attached. Appendix I.

Information

The information produced from this work will be available to staff at Massey University and the teachers at the school or schools involved. It may be used as a basis for research papers in this area of consumer research. The participants will only be identified by christian names, if at all.

ETHICAL CONCERNS

The children will be between the ages of about seven and nine. While they can decide whether or not they want to participate they can not really give informed consent. Therefore after possible candidates have been selected by discussion with the class teachers, the children will be asked if they would like to join the project. Then a parent or guardian will be approached to give consent for their child to join the project.

It is intended that the children in the project enjoy their "meetings". The child will be allowed to withdraw from the project at any time. All children will be watched closely for any signs of distress but because the researcher will not know each child very well some less obvious signs may be missed. To try to alleviate this problem, withdrawal from the project can be done on a child's own say-so, on the request of their teacher or parent/guardian.

LEGAL ISSUES

There are no legal concerns with this project.

GUIDANCE

As this project involves young children it was felt that it was extremely important to have the approval of the ethics committee for the continuation of this project.

Any suggestions in terms of protecting the rights of the children and their parents or guardians would be most welcome.

OTHER ETHICAL COMMITTEES

This project will not be submitted to any other ethical committees.

Appendix 3.4: Consent Letter to Caregivers

Appendix 3.4: Examples of Newsletters Sent To Caregivers**3.4(a) Toy Study Newsletter April 1992****Toy Study Newsletter**

Dear Parent or Caregiver,

Thank you for allowing your child to participate in this study.

I received a 100% positive response for which I am most grateful.

The girls may have already told you that they completed an activity in class, several months ago, as a preliminary study to this work. While all the data has not been analysed I thought you might be interested in some of the results.

The activity involved 41 girls and 50 boys aged between 5 and 9. The classes were shown the toys as listed below:

Ludo	Paddle Ball
Scattergories	Paint by Numbers
Modelling clay	Magic Set
Sindy Doll	Cube Puzzle
Turtle	Set of Paints and Crayons
Lego	Water Game
Water Slide	

They were asked which toy they like the best, if they could only have one, and which toys they would choose if they could have five. They commented on why they liked their favourite toy from the ones shown. They were also asked to draw a picture of their favourite toy at home and say why they liked it.

The results and comments make interesting and delightful reading. I am sorry that there is too much to include here.

When asked to choose one of the toys the results were as follows:

	Girls (Total 41)	Boys (Total 50)
Ludo	0	0
Scattergories	2	1
Modelling clay	6	3
Sindy/Turtle	13	5
Lego	0	5
Water Slide	6	8
Paddle Ball	0	2
Paint by Numbers	1	0
Magic Set	8	7
Cube Puzzle	2	8
Set of Paints and Crayons	3	5
Water Game	0	6

If you split the girls into age groups you see the following choices:

6 yrs

Magic Set	1
Sindy	6
Paint by Numbers	1
Water Slide	1

7 yrs

Sindy	5
Crayons/Paints	1
Scattergories	1
Water Slide	4
Modelling Clay	2

8 yrs

Magic Set	7
Sindy	2
Crayons/Paints	2
Scattergories	1
Slide	2
Cube Puzzle	2
Modelling Clay	3

The preferred choice of a doll obviously decreases as the age increases!

When the girls were asked to choose five toys they chose the following toys:

Ludo	5
Magic Set	27
Sindy	28
Lego	6
Crayons/Paints	22
Scattergories	18
Water Slide	22
Paddle Ball	5
Water Game	11
Rubik Type Cube	12
Modelling Clay	28
Paint by Numbers	16

When asked to put the five toys in order of preference the Sindy and the modelling clay came out equal. Therefore it is these two toys they will be working with for the rest of the study.

I hope this brief summary of results is of interest to you. If you would like to see your child's form you are quite welcome to contact me and I can send you a copy. I can be contacted at:

Consumer Technology Department
Private Bag
Massey University

Ph: 3569099 extn 8254

Any other questions you may have don't hesitate to give me a call.

Attached is a timetable and the groups the children are in so you can see which days your child will be involved.

Regards

Carol Pound

Appendix 3.(b) Toy Study Newsletter July 1992

TOY STUDY NEWSLETTER

Dear Parents and Caregivers,

You may have heard from the girls that they have now completed two sessions of the Toy Study.

The first session, on idea generation, was most successful. All of the groups were capable of generating new ideas for dolls. Some of the ideas were very original. The groups were also able to clearly state what they did and did not like about the dolls.

In the second session, completed this week, I used all the ideas and the girls were involved in screening them so that I can determine which of the dolls were most popular.

The girls screened complete ideas for new dolls and a list of features, such as hair type, age of doll and so on, that they had thought of in the earlier sessions.

However because of the large number of ideas the groups produced the analysis of this screening is taking longer than I would have expected. It is therefore necessary to move some of the concept development sessions to a week later so I can complete the analysis. The new dates will be:

3 August	Group C
4 August	Group B
5 August	Group E
7 August	Group D
10 August	Group A
11 August	Group F

The children are very good at remembering which dates they are doing the next session so I would be grateful if you could discuss the changes with them so they don't feel like they have been left out.

I am enjoying working with the children and have been impressed by the quality of work they are doing.

If you have any questions about the project so far please don't hesitate to contact me ph: 3569-099 extn 8254.

Regards

Carol Pound



**MASSEY
UNIVERSITY**

Private Bag 11222
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Facsimile 0-6-350 5612

**FACULTY OF
TECHNOLOGY**

DEPARTMENT OF
CONSUMER
TECHNOLOGY

Appendix 4.1: Consent Letter to Caregivers

To the Parent or Caregiver of: *Child's Name*

(Please read the following very carefully)

Name has been selected to participate in a project on toys. The aim of the project is to collect information on the factors that make a toy, a good toy to a child. Over the next three months *Name* will be asked to complete a series of activities. These will be conducted in small groups of about six little girls of the same age. The groups will all meet at the school and no session will take more than one hour. The sessions will be held at towards the end of the school day when the children normally do "fun" activities rather than regular class work. The activities will consist of playing with different toys, writing stories, drawing pictures and completing simple tasks, like putting toys in order of preference. The girls will be rewarded with a sticker on a certificate each time they participate and all will receive a small gift at the end of the project.

At times the activities will be recorded on video or by tape recorder and at other times notes will be taken, or the work of the children collected in. At the end of the project all videos and tapes will be destroyed. All activities are non competitive. There are not right or wrong answers to this work, and at no time will the children be compared to one another or made to feel they are not as good at the activities as the other children in the group. The objective is for the children to have a fun time while doing the activities as this will produce the best data for the project.

The work will be published as the thesis, but the individual children will not be able to be identified in the published report. During the project you will be provided with progress reports on the activities that *Name* has been doing. At the end of the project you will given an opportunity to discuss the project with me and see any results that I have collected.

Name has probably already completed some work with toys as a class project with me a few weeks ago. Could you discuss this with her and see if she would like to carry on with the work. Once you have made a decision about *Name* participating in this project please complete the attached form and return it by the 1st of May, either through the school or directly to me. If you have any questions then please contact me at work 3569-099 ex 8254 or at home (06) 3766654 any time.

The project will be carried out between the beginning of May and the end of August (excluding school holidays). When exact dates are known you will be notified.

You are free to withdraw your child from the project without explanation or contact me with any problems or questions you may have at any time.

Thank you for your cooperation.

Carol Pound
Lecturer in Product Development
Consumer Technology Department
Massey University

CHILDREN'S TOY PROJECT
CONSENT FORM

I consent/do not consent to *Full Name* participating in the toy project.

Signature of Parent or Caregiver

Date_____

Relationship to child_____

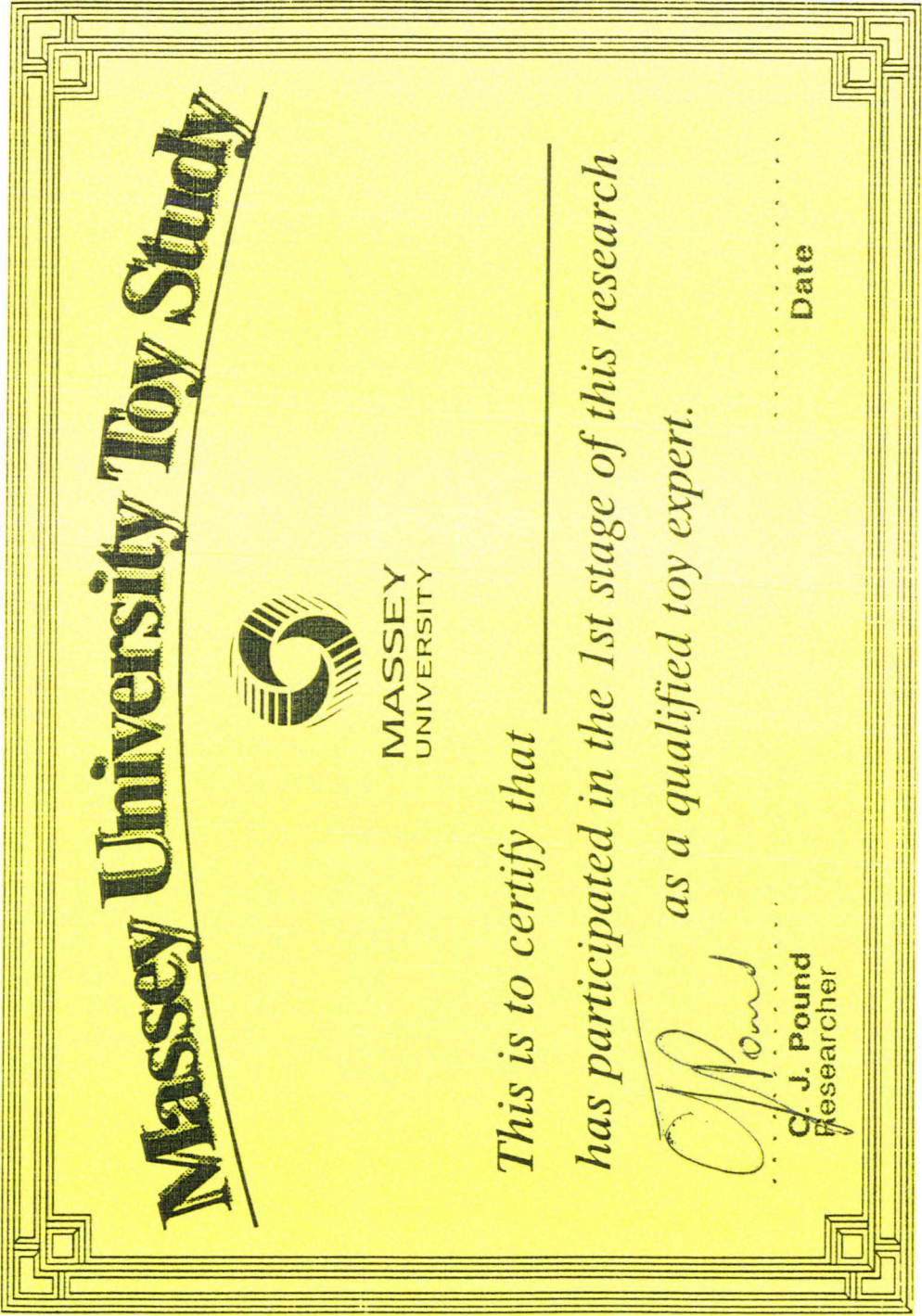
Name and Address of Parent or Caregiver (please print)

Contact phone number

Home_____

Work_____

Appendix 4.2: Group Introduction Certificate
presented to each Child



Massey University Toy Study



*This is to certify that _____
has completed the following activities towards
the development of a new product.*

Idea



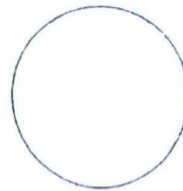
Generation

Idea



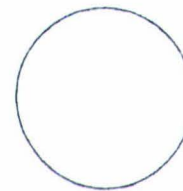
Screening

Concept



Development

Concept



Testing

.....
C.J. Pound
Researcher

.....
Date

Appendix 4.3: Small Group Study Certificate
presented to each Child with
Examples of Stickers

Appendix 4.4: Timing of Small Group Sessions
TIMETABLE OF EVENTS

<u>Date</u>	<u>Activity</u>	<u>Group</u>
Mon 15 June	Idea Generation	B
Tue 16 June	Idea Generation	C
Wed 17 June	Idea Generation	F
Fri 19 June	Idea Generation	D
Mon 22 June	Idea Generation	A
Tue 23 June	Idea Generation	E
Wed 1 July	Screening	D
Fri 3 July	Screening	A
Mon 13 July	Screening	C
Tue 14 July	Screening	F
Wed 15 July	Screening	E
Fri 17 July	Screening	B
Mon 27 July	Concept Development	E
Tue 28 July	Concept Development	D
Wed 29 July	Concept Development	A
Fri 31 July	Concept Development	F
Mon 3 August	Concept Development	C
Tue 4 August	Concept Development	B
Tue 18 August	Concept Testing	F
Wed 19 August	Concept Testing	C
Fri 21 August	Concept Testing	B
Mon 24 August	Concept Testing	D
Tue 25 August	Concept Testing	A
Wed 26 August	Concept Testing	E

All the sessions were between the hours 2.00 pm and 3.00 pm with a duration of 30 to 45 minutes.

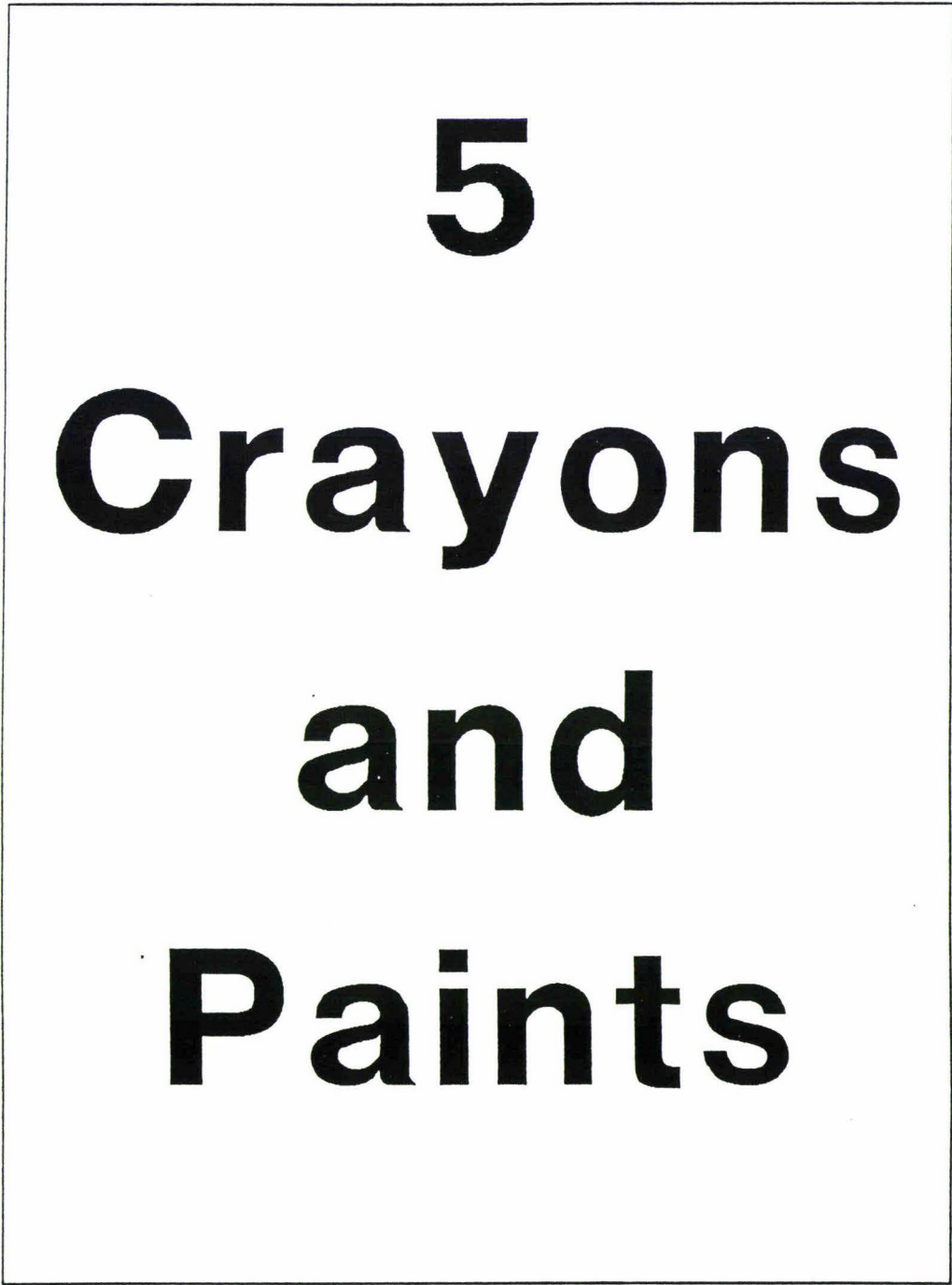
Appendix 5.1:

Demographics of the Consumer Sample in the Group Introduction

Age (years)	Number of Children					Total
	5	6	7	8	9	
Gender						
Female	1	14	13	13	0	41
Male	1	21	14	12	2	50

Appendix 5.2: Example of Labels for Toys used in the Group Introduction

Note: Labels were originally A4 size



Appendix 5.3: Questionnaire for Group Introduction

Massey University

Toy Study

There are 12 toys in the front of the class. If you could only have 5 of these toys which 5 would you choose?

1. Write the numbers of your 5 toys here

2. If you could only have one toy which one would it be?

3. Why did you choose this toy as your most favourite?

4. Can you put the 5 toys that you have chosen in order from best to worst? Put the number of the toy you like the most at the top.

1 _____ (The toy you like best)

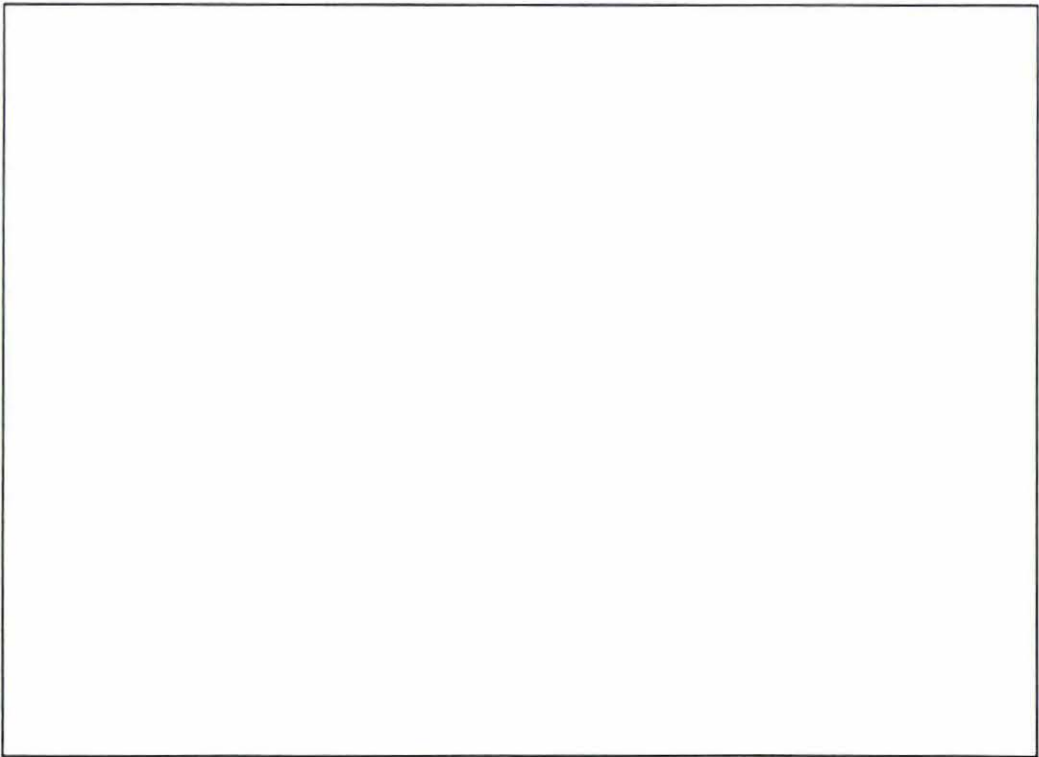
2 _____

3 _____

4 _____

5 _____ (The toy you like least)

5. Draw a picture of your favourite toy that you have at home.



6. Why do you like this toy best?

7. What is your name? _____

8. What is your age? _____

9. What date is your birthday? _____

10. What room number are you in? _____

11. What is the time now? _____
(Look at the clock.)

When you have finished give this form to me.

Appendix 5.4: Reasons for Toy Choice in the Group Introduction

(Please note these are the children's words and spelling, not those of the researcher or a computer error).

Why did you choose this toy as your most favourite*Five year old females*

Paint by numbers - bcos it is intrsing (interesting) I licke (like) it.

Six year females

Water slide - I can go donw it and I like water and I havet get one

Water slide - I choose it because it was fun and it is cool

Water slide - I like swimming

Sindy - I like one toy cuase it is really nice

Sindy - because they are pritty

Sindy - it is pritty

Sindy - sindy because you like it fun and magic

Sindy - its nice

Sindy - I liked it because I have got heps at home. And I like them.

Sindy - because Ive lost mine and broken it. I like Sindy's

Sindy - Becose she looks hot and they are nice

Sindy - becaise i like barbei

Magic Set - because it is a fun game

Modelling clay - I like it becuase wen you have amed them you can gev the to popal.

Seven year old females

Sindy - I like sindy because they are fun to play with

Sindy - because its togs can change couler(colour)

Water slide - I like it because you get wet

Scattergories - I liked itb becas I like spilling

Scattergories - because I have palyd it before

Crayons and Paint - because I like drawing and my favourite subject is art

Magic Set - becaus I like waching magic tricks and I would like to have a go at some my self

Magic set - because I want to make a magic show

Magic set - I choose that one because I can play magic thing to my sister and brother

Modelling clay - I like it because it is fun to play with

Modelling clay - I like to paly with sort clay things

Modelling clay - because you can keep what you make

Modelling clay - because I like make tinning (things) with clay

Eight year old females

Magic set - because I love magic and like making people smile

Magic set - be cose you can trik your friend

Magic Set - because you could do lots with it and you could do magic shows with it

Magic set - because there is lots of tricks to do

Crayons and paints - be couse it has lots of thing in it

Crayons and paints - because I like drawing and the lovely colours

Water slide - Because its fun

Water slide - because I like them

Cube puzzle - because I have one at home and they are really esay to do

Cube puzzle - becaues it is cool

Sindy - because I like palying with barby dolls

Sindy - because I like playing with barby dolls all the time

Modelling clay - because you can make things with it and you can cook them and keep them

Five year old males

Cube puzzle - I thought it was the best

Six year old males

Lego - I chose Lego because you can build Lots of Things and it is fun to play with

Cube puzzle - You always get it right

Magic set - Because you can do heaps of magic

Magic set - Want to learn magic

Cube puzzle - I like it because the puzzle is cool

Cube puzzle - I like cube puzzle because it It is fun.

Paddle Ball - Becaese you can Play it all The Time

Paddle Ball - Because it is good and because i have tried one

Crayons and paints - Be coue I like drawing

Modelling clay - I like it because you can make things with them

Water game - becane it is pacman

Water game - I like it because I like water games

Water game - I chose it because my old one got broken

Water game - by cos it is got a bant in and water in it uos it is fne(fun) going(game)

Water slide - Good to slide on with soap and water

Water slide - I like it because you land in a pool at the bottom

Water slide - Been on one before and fall into pool at the end

Water slide - it is cool
 Water slide - I can go down it and it is fun on it and you get water
 Water slide - I've got it at home
 Ninja Turtle - because I like playing with them

Seven year old males

Modelling clay - I did choose Number 11 because you can make stuff out of it then you put it in the (oven)
 Modelling clay - because I like playing and making things with Fimo
 Cube puzzle - I choose This toy because I enjoy Playing with It and I've got it at home.
 Cube puzzle - because it's fun to make
 Water slide - Like to play in the water
 Lego - because it is Lego and Lego is my favourite
 Lego - because it's fun to build with
 Magic Set - Lots of things to do
 Magic set - Chs it is my favourite toys
 Magic set - because I like magic
 Paddle ball - I like to play
 Paddle ball - because when you hit it it stays on the ground
 Ninja turtle - I like the ninja turtle because I like ninja
 Ninja turtle - I like the cube puzzle and I like the modelling clay fimo

Eight year old males

Lego - x because it's (technic lego) good for the development of the brain and very good and you can be proud of that (what) you have done
 Lego - Nice to play Lego
 Magic set - It will be a fun game
 Magic set - because I like magic
 Ninja Turtle - I don't have one
 Crayons and paints - Because I've got another set at home that is different
 Crayons and paints - because I like art
 Water slide - because you can play with outside
 Crayons and Paints - because I like drawing
 Crayons and paints - because it is my favourite
 Cube puzzle - it is exciting fun technically
 Cube puzzle - because it takes a long time to do and it is fun doing it it is fun(fun)

Nine year old males

Scattergories - because it is a game that improves your spelling

Water slide - I have got one and I play on it a lot

They were asked to say why they like their favourite toy at home best.

Five year old females

Soft toy centipede - bcos i have it in bed

Six year old females

Knitting machine - becuse i think it is fun

Soft toy (care bear?) - because it repeats the words

Soft toy - becuse Its fluffy

Soft toy - It is fluffy It is soft It is play full If has nice wiskis

Piano - because it plays muiic and it is my own

Doll - I change lipstick and earrings

Doll - I Love it it is cool and I like ti

Rag doll - because it is ncie and soft old surufy looking prity

Sindy - I like its clothes

Sindy - I play with it all the time and so dose my mum and dad my cat hates it I didn't

Sindy - sometimes I play Sindy Sometimes I not cours I like turtles the best

Magic set - because it is nice Magic make you happy

Roller skates - It is good fun

Netball hoop and ball - I like it because wen I get olnder I wil be very good

Crayons and paints - because you can panit with them. I had got my one for my birthday but onit itsaid that it were 4 years old.

Seven year old females

Berty Basit - becace his name is funny and his looks funny

Dog - because it is warm and fluffy and it is like a toy

Scattergories - I like it best because I Always win

Ball - I like my ball because it is basy

Art set - because I use my art set a lot and I like art

Fimo - because I like clay

Water slide - because it is fun to go on

Book - because I like to read

Doll - because I like it

Doll and Care bear - because they are nice

Doll - because you can change it's hair colour

Doll - because its nice & cuddly

Eight year old females

Popple and Troll - I like popple because she is a soft toy and I like sleeping with her I like troll because she looks cute
 Troll - because is has a nice dress and pretty shoes
 Crayola - Be couse it has lots ofthings in it and its is caulafull
 Paint set - be cose it si cratv and potrts and hill sites
 Doll - because It's good to play with
 Television - because when I go home after sholl I wacht t.v
 Animal - (soft toy?) I like it because it remineds me of my dad when he goes away
 Soft toy - because my dad gave it to me and its soft and cuddly
 Soft toy bunny - She is the biggest and Best toy I have
 Television - because you can watch it when you haven't got anything to do. I watch it a lot. We have got a video too. I like watching it too.
 Guess who game - Because two people can play with it
 Computer - cause it is Fun lots of games neat to play by your selfs.
 Minnie mouse - because I have a hole room full of minnie

Five year old males

Lego - because can paly with it at home and make things with it like motorbikes

Six year old males

Lego - because it has Lots of bits and you can make something really big and fun to play with
 Lego - becuus you can make thiengs
 Lego - because I can make things out of them and because theres heps of it
 Cube puzzle - Always get it right and I like it and sister can not do it
 A car - Because I can push my toys fast the door opens when I lift the roof
 Hot rod car - Be cove it duvi wetiv
 Car - I like it becamse it dars (does) welwe (wheelies)
 Car - by cos it gos arand orso be it ges eneyen
 Water game - Because you can Play all Day with it
 Water game - We chewed the lid of may water game and I got it for christmas
 ????? Because i can draw cool things and Because i like palying with it
 Tweetie bird - Because it squeek an the beak
 Ninja turtle - because it plays with me
 Skate board - because it goes fast
 Roller blades - Good fun
 Transformer???? - because they are cool
 ????? Because it is the biggest and expensive
 Water slide - I slide on At
 Water slide - good to slide on whenever you want because it si my toy

Rugby/Soccer/Cricket - it is fun. spots
Ninja turtle- did not complete the form

Seven year old males

Computer games - I like this toy best because you can play lots of games on it
Sega game - Best thing at home Play with it most of the time
BMX bike - I Like this toy because I Like doing stunts
Fimo - because I lik playing with clay
Clock - becuse I can tall the time when its mutnight and it is Fun I lkie Klooks
Swing ball - Becouse I like playing tennis
Lego - I like it becuse it is fun to make thing is
Magic set - you can learn lots of stuff It has lots of things
Fire Engine (lego???) - because its Fun to mace
Ninja turtle - Cos it is a ninja turtle
Ninja turtle - did not complete the writing
Ninja turtle - did not complete the form
????? becuse I like playing Ihem

Eight year old males

Lego Truck - becuse it is good for the bane (brain) and you can be pord(proud) onr what you have done
Lego - I can make anything
Technics Lego - because you can make diffrent things
Truck - Open and the turtle springs out It moves It goes
Chemistry set??? Because you can do ecsperamts (experiments) with tham
Soft toy - because I got it made when I was one
Toy dog - It barks like a real dog
????? CihS Becaus it is farn (fun) and kampilrted and farn cibs
???? It is ace
Cricket bat - because it is fun
Car and trailor - Because it is acar
Scattergories - it is fun

Nine year old males

Bat and ball - because I like hitting things around
Maze game - it is fun

Appendix 5.5: Preference Data for Toys in the Group Introduction

Preference Scores for Female Children

Products	Age in Years			Total Score
	Six	Seven	Eight	
Ludo	2(1)	1(1)	9(2)	12(4)
Magic Set	13(5)	25(9)	32(8)	70(22)
Sindy/Turtle	46(11)	23(8)	20(6)	89(25)
Lego	4(3)	4(1)	3(1)	11(5)
Crayola	22(7)	15(6)	24(9)	61(22)
Scattergories	7(3)	27(8)	13(6)	47(17)
Water Slide	24(8)	16(6)	15(6)	55(20)
Paddle Ball	0(0)	3(1)	3(2)	6(3)
Water Game	5(2)	6(3)	6(4)	17(9)
Cube Puzzle	7(3)	9(3)	20(6)	36(12)
Modelling Clay	16(7)	37(9)	34(10)	87(26)
Paint-by-Numbers	19(5)	14(5)	16(5)	49(15)
Total Children	11	12	13	36

Preference Scores for Male Children

Products	Age in Years			Total Score
	Six	Seven	Eight	
Ludo	2(2)	1(1)	0(0)	3(3)
Magic Set	11(6)	27(8)	19(7)	57(21)
Sindy/Turtle	17(6)	7(2)	9(2)	33(10)
Lego	27(7)	22(6)	19(5)	68(18)
Crayola	5(3)	13(5)	15(5)	33(13)
Scattergories	6(2)	11(4)	5(1)	22(7)
Water Slide	28(7)	18(6)	21(7)	67(20)
Paddle Ball	5(2)	1(1)	4(2)	10(5)
Water Game	21(5)	7(4)	17(7)	45(16)
Cube Puzzle	13(4)	19(5)	19(5)	51(14)
Modelling Clay	15(6)	19(6)	3(3)	37(15)
Paint-by-Numbers	0(0)	5(2)	4(1)	9(3)
Total Children	10	10	13	29

Note: (1) Numbers in parentheses are the number of children that chose the toy.
(2) Each child had five choices.

The Total scores were then divided by the number of children in the group to obtain the mean preference score in Table 5.7. The scores in each age group were divided by the number of children in the particular age group to obtain the mean preference scores in Table 5.8

Stat-Packets Statistical Analysis Package

Analysis of Variance for Female Children

Design: One Factor Completely Randomized Design

	Number of Children	Mean	SD
Ludo	36	0.33	1.10
Magic Set	36	1.94	1.97
Sindy/Turtle	36	2.47	2.04
Lego	36	0.31	0.89
Crayola	36	1.69	1.67
Scattergories	36	1.31	1.65
Water Slide	36	1.53	1.83
Paddle Ball	36	0.17	0.61
Water Game	36	0.47	1.00
Cube Puzzle	36	1.00	1.67
Modelling Clay	36	2.42	1.93
Paint-by-Numbers	36	1.36	1.76

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	11	259.2222	23.5657	9.4643	0.0000
Error	420	1045.7778	2.4899		
Total	431	1305.0000			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)
Note: Statistics are only printed if p is less than or equal to .050

t = 4.3318 p = .0000	Ludo Magic Set	t = 6.1989 p = .0000	Sindy/Turtle Paddle Ball
t = 5.7508 p = .0000	Ludo Sindy/Turtle	t = 5.3774 p = .0000	Sindy/Turtle Water Game
t = 3.6596 p = .0003	Ludo Crayola	t = 3.9584 p = .0001	Sindy/Turtle Cube Puzzle
t = 2.6140 p = .0093	Ludo Scattergories	t = 2.9874 p = .0030	Sindy/Turtle Paint-by-Numbers
t = 3.2115 p = .0014	Ludo Water Slide	t = 3.7343 p = .0002	Lego Crayola
t = 5.6014 p = .0000	Ludo Modelling Clay	t = 2.6887 p = .0075	Lego Scattergories
t = 2.7634 p = .0060	Ludo Paint-by-Numbers	t = 3.2862 p = .0011	Lego Water Slide
t = 4.4065 p = .0000	Magic Set Lego	t = 5.6761 p = .0000	Lego Modelling Clay
t = 4.7799 p = .0000	Magic Set Paddle Ball	t = 2.8381 p = .0048	Lego Paint-by-Numbers
t = 3.9584 p = .0001	Magic Set Water Game	t = 4.1077 p = .0000	Crayola Paddle Ball
t = 2.5393 p = .0115	Magic Set Cube Puzzle	t = 3.2862 p = .0011	Crayola Water Game
t = 5.8255 p = .0000	Sindy/Turtle Lego	t = 3.0621 p = .0023	Scattergories Paddle Ball
t = 2.0912 p = .0371	Sindy/Turtle Crayola	t = 2.2406 p = .0256	Scattergories Water Game
t = 3.1368 p = .0018	Sindy/Turtle Scattergories	t = 2.9874 p = .0030	Scattergories Modelling Clay
t = 2.5393 p = .0115	Sindy/Turtle Water Slide	t = 3.6596 p = .0003	Water Slide Paddle Ball

t = 2.8381 p = .0048	Water Slide Water Game	t = 5.2280 p = .0000	Water Game Modelling Clay
t = 2.3899 p = .0173	Water Slide Modelling Clay	t = 2.3899 p = .0173	Water Game Paint-by-Numbers
t = 2.2406 p = .0256	Paddle Ball Cube Puzzle	t = 3.8090 p = .0002	Cube Puzzle Modelling Clay
t = 6.0496 p = .0000	Paddle Ball Modelling Clay	t = 2.8381 p = .0048	Modelling Clay Paint-by-Numbers
t = 3.2115 p = .0014	Paddle Ball Paint-by-Numbers		

Analysis of Variance for Male Children

Design: One Factor Completely Randomized Design

	Number of Children	Mean	SD
Ludo	29	0.10	0.31
Magic Set	29	1.97	1.72
Sindy/Turtle	29	1.14	1.75
Lego	29	2.34	2.06
Crayola	29	1.14	1.58
Scattergories	29	0.76	1.50
Water Slide	29	2.31	1.98
Paddle Ball	29	0.34	0.94
Water Game	29	1.55	1.76
Cube Puzzle	29	1.76	1.98
Modelling Clay	29	1.28	1.73
Paint-by-Numbers	29	0.31	0.97

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	11	187.5948	17.0541	6.6348	0.0000
Error	336	863.6552	2.5704		
Total	347	1051.2500			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .050

t = 4.4226 p = .0000	Ludo Magic Set	t = 2.8665 p = .0044	Magic Set Scattergories
t = 2.4570 p = .0145	Ludo Sindy/Turtle	t = 3.8493 p = .0001	Magic Set Paddle Ball
t = 5.3235 p = .0000	Ludo Lego	t = 3.9312 p = .0001	Magic Set Paint-by-Numbers
t = 2.4570 p = .0145	Ludo Crayola	t = 2.8665 p = .0044	Sindy/Turtle Lego
t = 5.2416 p = .0000	Ludo Water Slide	t = 2.7846 p = .0057	Sindy/Turtle Water Slide
t = 3.4398 p = .0007	Ludo Water Game	t = 2.8665 p = .0044	Lego Crayola
t = 3.9312 p = .0001	Ludo Cube Puzzle	t = 3.7674 p = .0002	Lego Scattergories
t = 2.7846 p = .0057	Ludo Modelling Clay	t = 4.7502 p = .0000	Lego Paddle Ball

t = 2.5389 p = .0116	Lego Modelling Clay	t = 2.8665 p = .0044	Paddle Ball Water Game
t = 4.8321 p = .0000	Lego Paint-by-Numbers	t = 3.3579 p = .0009	Paddle Ball Cube Puzzle
t = 2.7846 p = .0057	Crayola Water Slide	t = 2.2113 p = .0277	Paddle Ball Modelling Clay
t = 3.6855 p = .0003	Scattergories Water Slide	t = 2.9484 p = .0034	Water Game Paint-by-Numbers
t = 2.3751 p = .0181	Scattergories Cube Puzzle	t = 3.4398 p = .0007	Cube Puzzle Paint-by-Numbers
t = 4.6683 p = .0000	Water Slide Paddle Ball	t = 2.2932 p = .0225	Modelling Clay Paint-by-Numbers
t = 2.4570 p = .0145	Water Slide Modelling Clay		
t = 4.7502 p = .0000	Water Slide Paint-by-Numbers		

Appendix 6.1: Form for the Projective Letter Writing Technique

Letter to My Best Friend

Dear _____

I went to town yesterday and saw this really neat doll.
I have never seen a doll like this before, not even on
T.V.

The doll was _____

Love from _____

Appendix 6.2 Form for the Projective Drawing Technique

**A PICTURE OF A DOLL THAT I WOULD
LIKE TO HAVE**

Appendix 6.3: Focus Group Comments from Taped Conversations

Group B Aged Six

Like about Dolls

Ring in hair
Dresses
Roller skates
Dress up in different clothes
Big
Can make clothes for them
Pretty
Can do the splits

Don't Like about Dolls

Nothing don't like
about them
Short hair
Heads falling off

Like/Dislike about Modelling Clay

Make lots of things out of them
make pretend things like lollies
Cook and keep them
do different things with them
colours all different ones.

A New Doll

Make dolls out of modelling
clay - needs to be softer
Shape the doll and cook it
Make parts of the doll like
legs and arms
Make accessories like a car
to play with
Make animals from it
Make a horse for Barbie to ride on
Lolly pop to eat
Squishy modelling clay can be
into a big ball
Make shoes earrings plates spoons
and cook them

Group C Aged Seven

Like about Dolls

Don't play with dolls
Hair
Like playing with long hair
Like hair
Pretty
We do their hair we don't
play with them
Like accessories on the doll
Like the bath-time Barbie
Like to have lots of clothes
Want shoes and earrings to
put on the doll

Don't Like about Dolls

Everything
Don't like playing with dolls
Needs a nicer dress
They are too pretty
Ugly
Don't have nice clothes
Don't have nice hair
Weird clothes
Hair all over the place
Hair comes out
Don't like knee pads

Like/Dislike about Modelling Clay

Too hard
When you bake it you
Can't use it again
Is something to do

A New Doll

Spray paint the doll
wash off in water
A doll whose hair goes
different colours in water
Dolls here are good
Like all the dolls here
Not having a bosom
Roller blades
Computer games have more
games to play. Make the
doll alive and a robot to move
about and then play on the
computer with it
Make lollies inside its tummy
Tell the doll to do
something and it will do it
Know everything in the world
and does maths, reading
and writing for you
Clay hard to make look good
Make modelling clay easier to
make things. Say already have
eyes/nose and you just shape it
Don't want to make dolls too hard
Have a robot do it

Group F Aged Eight

Like about Dolls

Dolls are fun to play with
Can do the splits
Bored so play with them
Lots of different games
Can play blind date
Have 20/18 Barbies
Pretty
Real cool full stop
Like doing the hair
Put different clothes on them
Really like bath-time Barbie
Yell at them and they can't hear

Don't Like about Dolls

Don't like the big tits
Barbie has really big ones
they look disgusting
Can't put the dolls in water
Can't get the clothes on and off
easily - tops break
Eyes stretch when you pull the head
Lose the earrings and the shoes
Hard to get dressed
Sindy's shoes don't fit Barbie

Like/Dislike about Modelling Clay

Change into different things
Can cook it
Make things you can use - beads
hair clips etc.

A New Doll

Take off arms to change the clothes
Wear wigs to change the hair
Want a doll that can walk talk sing
dance cook climb trees drive
Move on their own
Follow you when you walk
Move arm automatically
Hair dryer that works
Living doll
Dress its self
Hard to keep some of the
clothes on
Make Barbies out of splat ball
material
Make stand for the doll
Make stick on clothes
Play with the clay and the doll
Make a box out of the clay to store
stuff in for the doll
Make extra bits out of the dough
Electronic doll
Can't be alive
Talkative back to you
Ability to move arms and legs
Roller blades
Doll to do maths
Money box doll

Appendix 6.4: Drawings and Letters from Projective Techniques



Six Year Olds



Six Year Olds



Six Year Olds



The doll was a preety sindy
she had a spakling dress
on a A ^{fifty} ~~flaty~~ eadi Bedds
earfings higheels.

The doll was cute, It was
a little baby
that crawled and
talked. It Jumps. It
walked a long way for
and it ~~swims~~ swims. to
I wish I had one. It was
a doll that had a
dog. It had pink lipstick
and sparkley hair with different
coloured hair as well.
the end

The doll was a sindy and she
ced talk. and it had a
beautiful ^{dress} dase and I weiste
I ~~had~~ had it.

The doll was like - hair down
its back down to its
feet its not av
verny clever doll. I
wish it was a doll
with a gitor.



Seven Year Olds



Seven Year Olds



Seven Year Olds



The doll was a new doll.
it had a head in a doll
like a doll, like a doll

The doll was a Singing doll ~~was~~ her
name ~~was~~ is Maddone
her hair is curly
She is just like
the real one but
a doll I went
to a toy store
There were lots
of barbie's goodby

The doll was like a fort with hina
~~with~~ like a doll it ~~play~~ plays
Netball and it dose not
~~know~~ no how to ride a horse.
And The doll was a bad
doll. and I hate it because
it is ugly

The doll was Cool. It looked was
a Cook doll. It had a
yellow, white hair. It was wearing
a short skirt. I forget to
tell you that it can play
Netball. Your name is Anna.
She has blue creins.
She has cool cool boots.



Eight Year Olds



Eight Year Olds

The doll was neat and I really enjoy playing with it. The doll had a lovely hair and dress. The doll got her own makeup. And she got the lovely shoe.

The doll was neat and it had pink hair and I like to show the doll but the doll that I draw it looks better then it looks.

~~The doll was~~ My doll is like a troll
it has a hat and a big
smile. she will be suitable
for kids about the age of
9-11.

~~The doll was like a~~ My doll/I like would have
sparkles and long blond hair,
blue eyes and nice clothes.

Appendix 7.1: Cards for Screening Product Attributes

**LONG
HAIR**

**SHORT
HAIR**

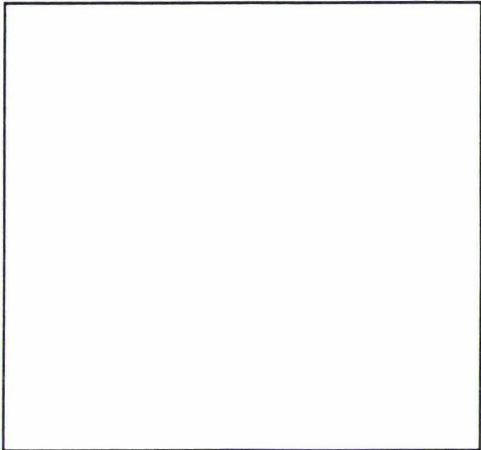
**SINGING
DOLL**

**BLACK
HAIR**

**TALKING
DOLL**

**STICK ON
CLOTHES**

**BLONDE
HAIR**



**MOVE ARMS AND
LEGS LOTS
OF WAYS**

**BABY
DOLL**

**ADULT
DOLL**

**DOLL THAT IS
YOUR AGE**

**TEENAGE
DOLL**

**OWN
MAKE-UP**

PRETTY

UGLY

**NOT PRETTY
OR UGLY**

**LOOKS LIKE
A PRINCESS**

**WEARS MODERN
CLOTHES**

**WALKING
DOLL**

**DOLL THAT
TALKS BACK**

**LARGE
DOLL**

**SMALL
DOLL**

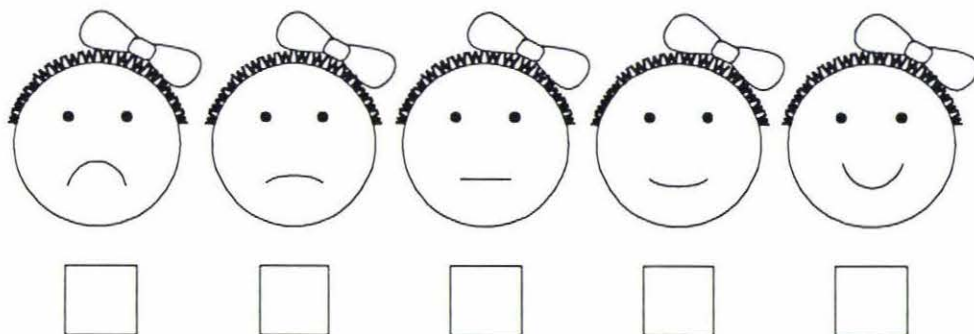
**DOLL THAT
CAN GO IN
THE WATER**

Appendix 7.2: Smiley Face Scale Questionnaire for Scaling of Product Ideas

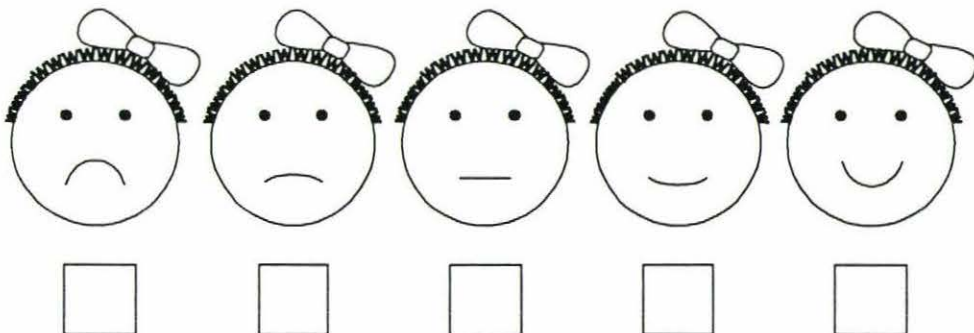
CHOOSING THE DOLLS YOU LIKE BEST

After you have read the sentences about each doll tick the face that best describes how you feel about it.

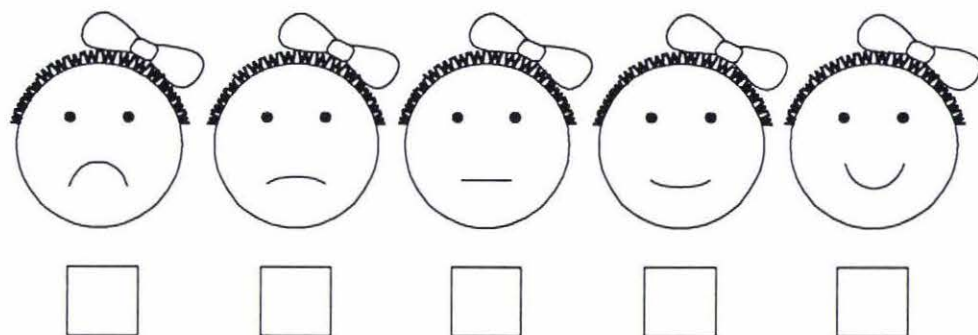
1. A netball doll dressed in a "Silver Fern" netball uniform. She comes with her own netball and hoop.



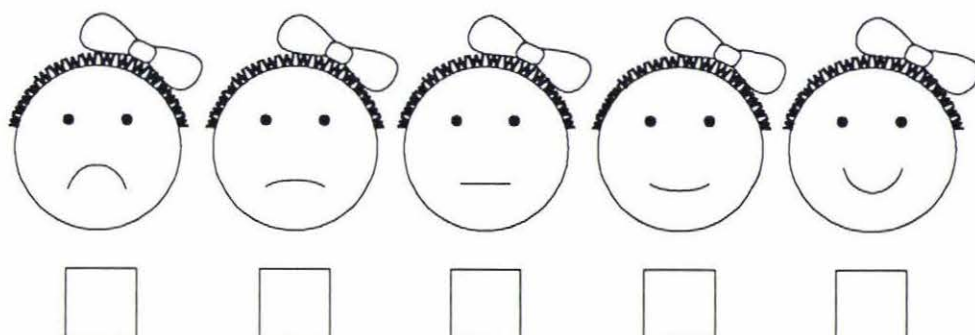
2. A doll that can be made to do things using a computer.



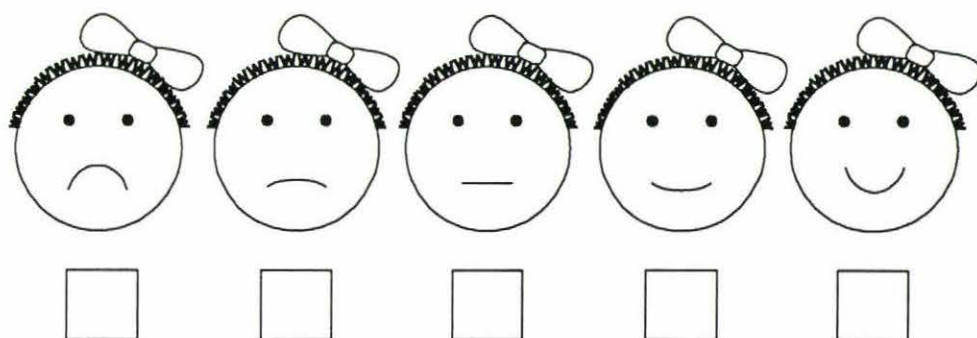
3. This doll comes with a face and you make different bodies, legs and arms out of modelling clay using moulds that come with it. The clay can be baked if you want to keep the doll.



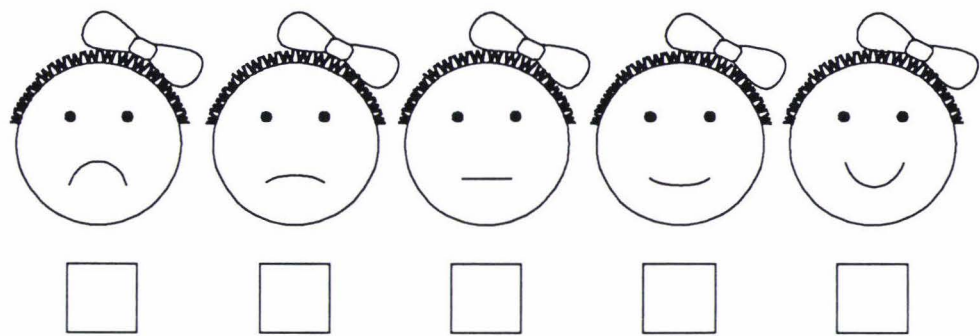
4. This doll is like a Bathtime Barbie except you spray on the clothes using paint and they stay there until you wash them off.



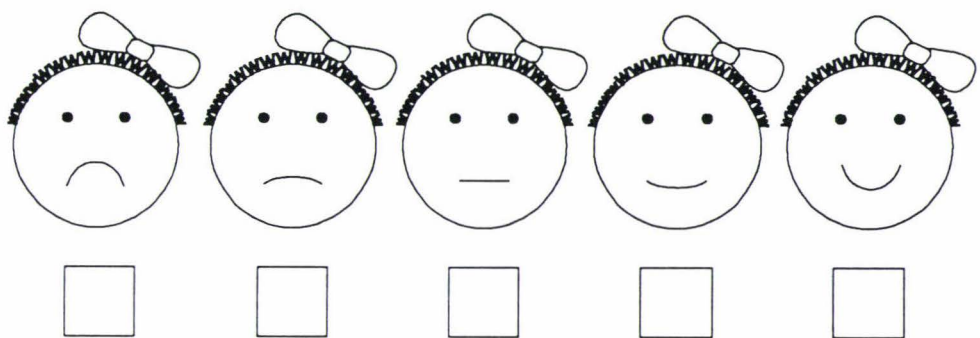
5. A doll with lots of wigs in different colours and hair styles that you can change.



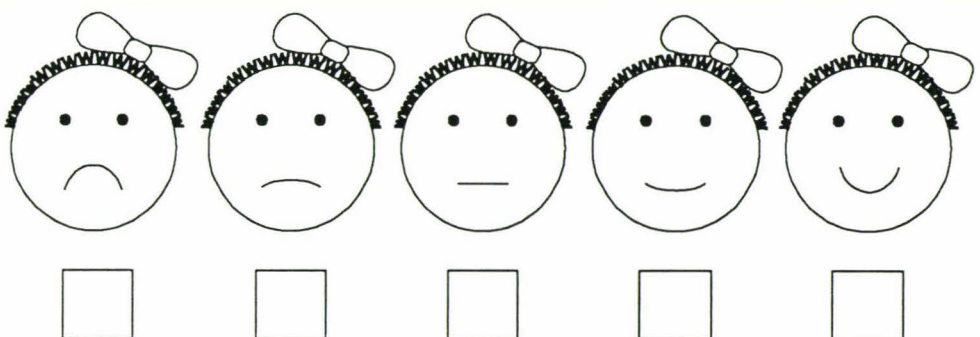
6. A doll that looks and sings like Madonna.



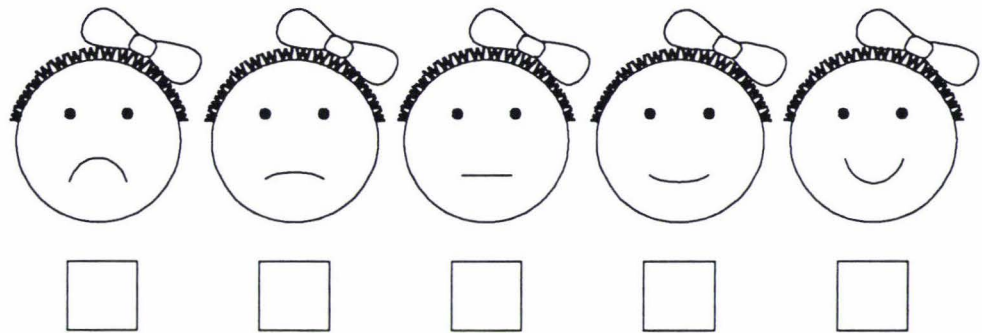
7. This baby doll walks, talks, crawls and swims.



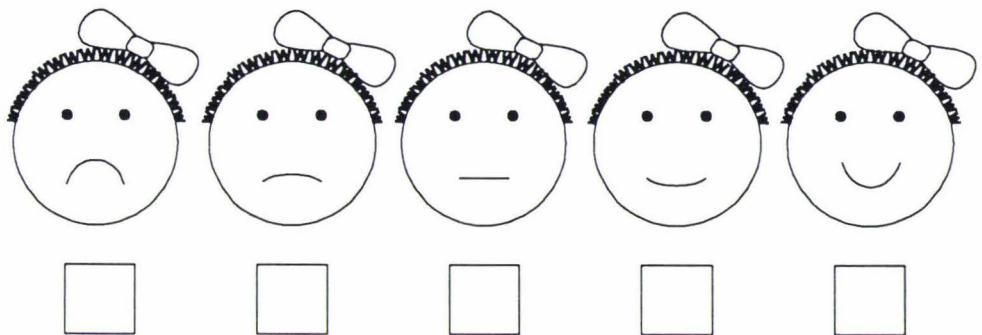
8. A horse that looks real but is operated by levers. It can run and jump.



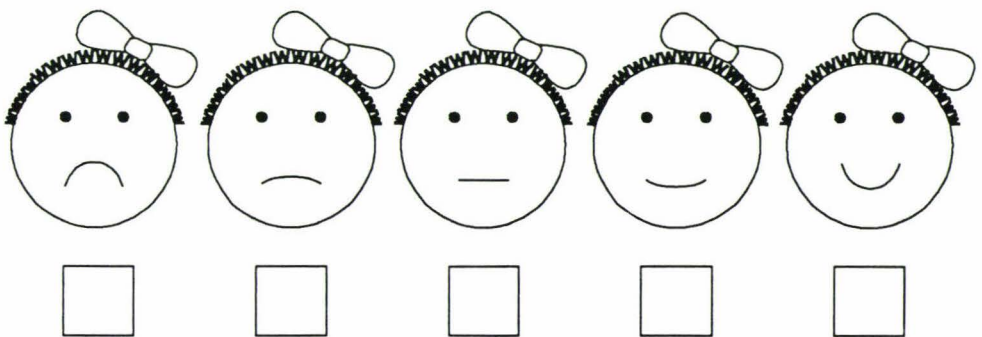
9. This doll is electronic and is made to go in the same way as a remote control car.



10. A doll that comes with lots of modelling clay and moulds so you can make shoes, earrings, food, plates and furniture to use with the doll.



11. This doll can bend its legs and arms. Its arms and legs can come on and off so that you can put the clothes on easier.



Appendix 7.3: Word Scale Questionnaire for Scaling of Product Ideas

CHOOSING THE DOLLS YOU LIKE BEST

After you have read the sentences about each doll tick the word that best describes how you feel about it.

1. A netball doll dressed in a "Silver Fern" netball uniform. She comes with her own netball and hoop.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. A doll that can be made to do things using a computer.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. This doll comes with a face and you make different bodies, legs and arms out of modelling clay using moulds that come with it. The clay can be baked if you want to keep the doll.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. This doll is like a Bathtime Barbie except you spray on the clothes using paint and they stay there until you wash them off.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. A doll with lots of wigs in different colours and hair styles that you can change.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. A doll that looks and sings like Madonna.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. This baby doll walks, talks, crawls and swims.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. A horse that looks real but is operated by levers. It can run and jump.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. This doll is electronic and is made to go in the same way as a remote control car.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. A doll that comes with lots of modelling clay and moulds so you can make shoes, earrings, food, plates and furniture to use with the doll.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. This doll can bend its legs and arms. Its arms and legs can come on and off so that you can put the clothes on easier.

Really Gross	Gross	Okay	Choice	Really Choice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 7.4: Product Attribute Rating from the Sorting Tests

		% of Total Children			
	Categories	Number of Children	1st Sort %like/ %dislike	2nd Sort % Liking	%Overall
Baby doll	Dislike	22	56.4		56.4
	Like little	2	43.6	11.8	5.1
	Like some	3		17.6	7.7
	Like a lot	12		70.6	30.8
Teenage doll	Dislike	18	46.2		46.2
	Like little	4	53.8	19.0	10.3
	Like some	4		19.0	10.3
	Like a lot	13		62.0	33.3
Short hair	Dislike	27	69.2		69.2
	Like little	0	30.8	0.0	0.0
	Like some	4		33.3	10.3
	Like a lot	8		66.7	20.5
Stick on clothes	Dislike	28	71.8		71.8
	Like little	3	28.2	27.2	7.6
	Like some	4		36.4	10.3
	Like a lot	4		36.4	10.3
Ugly	Dislike	33	84.6		84.6
	Like little	1	15.4	16.7	2.6
	Like some	1		16.7	2.6
	Like a lot	4		66.6	10.3
Can go in water	Dislike	15	38.5		38.5
	Like little	4	61.5	16.7	10.3
	Like some	4		16.7	10.3
	Like a lot	16		66.6	39.9
Adult doll	Dislike	27	69.2		69.2
	Like little	1	30.8	8.3	2.6
	Like some	6		50.0	15.4
	Like a lot	5		41.7	12.8
Talks back	Dislike	18	46.2		46.2
	Like little	1	53.8	4.8	2.6
	Like some	7		33.3	17.9
	Like a lot	13		61.9	33.3
Modern clothes	Dislike	18	46.2		46.2
	Like little	3	53.8	14.3	7.7
	Like some	5		23.8	12.8
	Like a lot	13		61.9	33.3

% of Total Children					
	Categories	Number of Children	1st Sort %Dislike/ %like	2nd Sort % Liking	%Overall
Has own make-up	Dislike	11	28.2		28.2
	Like little	1	71.8	3.6	2.6
	Like some	2		7.1	5.1
	Like a lot	25		89.3	64.1
Long hair	Dislike	7	17.9		17.9
	Like little	2	82.1	6.3	5.2
	Like some	5		15.6	12.8
	Like a lot	25		78.1	64.1
Blonde hair	Dislike	14	35.9		35.9
	Like little	2	64.1	8.0	5.1
	Like some	5		20.0	12.8
	Like a lot	18		72.0	46.2
Black hair	Dislike	23	59.0		59.0
	Like little	2	41.0	12.5	5.1
	Like some	2		12.5	5.1
	Like a lot	12		30.8	30.8
Singing doll	Dislike	16	41.0		41.0
	Like little	4	59.0	17.4	10.3
	Like some	4		17.4	10.3
	Like a lot	15		38.4	38.4
Large doll	Dislike	26	66.7		66.7
	Like little	2	33.3	15.4	5.1
	Like some	5		38.4	12.8
	Like a lot	6		46.2	15.4
Princess doll	Dislike	11	28.2		28.2
	Like little	3	71.8	10.7	7.7
	Like some	6		21.4	15.4
	Like a lot	19		67.9	48.7
Small doll	Dislike	24	61.5		61.5
	Like little	4	38.5	26.7	10.3
	Like some	3		20.0	7.7
	Like a lot	8		53.3	20.5
Pretty	Dislike	7	17.9		17.9
	Like little	3	82.1	9.3	7.7
	Like some	2		6.3	5.1
	Like a lot	27		69.3	69.3

		% of Total Children			
	Categories	Number of Children	1st Sort %Dislike/ %like	2nd Sort % Liking	%Overall
Talking doll	Dislike	18	46.2		46.2
	Like little	2	53.8	9.5	5.1
	Like some	5		23.8	12.8
	Like a lot	14		66.7	35.9
Not pretty or ugly	Dislike	27	69.2		69.2
	Like little	3	30.8	25.0	7.7
	Like some	3		25.0	7.7
	Like a lot	6		50.0	15.4
Own age	Dislike	22	56.4		56.4
	Like little	2	43.6	11.8	5.1
	Like some	7		18.0	18.0
	Like a lot	8		20.5	20.5
Arms and legs flexible	Dislike	22	56.4		56.4
	Like little	1	43.6	5.8	2.6
	Like some	8		47.1	20.5
	Like a lot	8		47.1	20.5
Walking doll	Dislike	16	41.0		41.0
	Like little	3	59.0	13.0	7.7
	Like some	6		26.1	15.4
	Like a lot	14		60.9	35.9
All Cards	Dislike	450	50.2		50.2
	Like little	53	49.8	11.9	5.9
	Like some	101		22.9	22.6
	Like a lot	293		65.5	65.5

**Appendix 7.5: Analysis of Variance Between the Smiley Face Scale
and the Word Scale**

Stat-Packets Statistical Analysis Package

Analysis of Variance for each Age Group

Design: One Factor Completely Randomized Design

	Number of Children	Number of Concepts	Mean	SD
Six year olds word scale	6	11	3.43	1.02
Six year olds face scale	6	11	3.44	0.46
Seven year olds face scale	4	11	3.16	0.50
Seven year olds word scale	6	11	3.26	0.69
Eight year olds word scale	5	11	3.25	0.50
Eight year olds face scale	6	11	3.14	0.68
Total Children	33			

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	5	0.9275	0.1855	0.4141	0.8371
Error	60	26.8769	0.4479		
Total	65	27.8044			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Six year olds

t = .0573 Word scale
p = .9545 Face scale

Seven year olds

t = .3440 Face scale
p = .7320 Word scale

Eight year olds

t = .4141 Word scale
p = .6803 Face scale

Analysis of Variance for each Scale

Design: One Factor Completely Randomized Design

	Number of Children	Mean	SD
Level 1 Word scale	17	3.31	0.74
Level 2 Face scale	16	3.25	0.56
Total Children	33		

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	1	0.0733	0.0733	0.1692	0.6822
Error	64	27.7310	0.4333		
Total	65	27.8044			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

t = .4114 Word scale
p = .6822 Face scale

Appendix 7.6: Analysis of Variance Between the Children

Note : Uses Stat-Packets Statistical Analysis Package

Summary Table of Number of Significant Differences

Child Number	Number of Differences		
	Six Years	Seven Years	Eight Years
1	4	6	3
2	9	5	3
3	3	9	1
4	4	7	3
5	2	4	6
6	1	10	3
7	3	7	1
8	3	3	6
9	2	5	4
10	2	5	1
11	2	7	8
12	2	9	3
13	9	5	
14	0		
Total	46	82	42
Total Pairs	23	41	21

Using a cut-off point of greater than seven significant differences the data from child 2 and 13 in the six year olds, 3 6 and 12 in the seven year olds and 11 in the eight year olds was removed from the sample.

A complete set of data is contained in the rest of the Appendix

Analysis of Variance Between the Six Year Olds

Design: One Factor Completely Randomized Design

	Number of Concepts	Mean	SD
Child 1	11	4.27	1.10
Child 2	11	4.82	0.60
Child 3	11	3.00	1.73
Child 4	11	2.73	1.68
Child 5	11	3.55	1.69
Child 6	11	4.00	1.61
Child 7	11	3.00	1.41
Child 8	11	3.00	1.53
Child 9	11	3.45	1.37
Child 10	11	3.27	1.19
Child 11	11	3.55	1.57
Child 12	11	3.64	0.81
Child 13	11	4.82	0.60
Child 14	11	3.73	1.27

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	1	361.1753	4.7058	2.5662	0.0033
Error	140	256.7273	1.8338		
Total	153	317.9026			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)
Note: Statistics are only printed if p is less than or equal to .050

t = 2.2042 p = .0291	Child 1 Child 3	t = 2.2042 p = .0291	Child 1 Child 7
t = 2.6765 p = .0083	Child 1 Child 4	t = 2.2042 p = .0291	Child 1 Child 8

t = 3.1488 p = .0020	Child 2 Child 3	t = 2.2042 p = .0291	Child 4 Child 6
t = 3.6211 p = .0004	Child 2 Child 4	t = 3.6211 p = .0004	Child 4 Child 13
t = 2.2042 p = .0291	Child 2 Child 5	t = 2.2042 p = .0291	Child 5 Child 13
t = 3.1488 p = .0020	Child 2 Child 7	t = 3.1488 p = .0020	Child 7 Child 13
t = 3.1488 p = .0020	Child 2 Child 8	t = 3.1488 p = .0020	Child 8 Child 13
t = 2.3616 p = .0196	Child 2 Child 9	t = 2.3616 p = .0196	Child 9 Child 13
t = 2.6765 p = .0083	Child 2 Child 10	t = 2.6765 p = .0083	Child 10 Child 13
t = 2.2042 p = .0291	Child 2 Child 11	t = 2.2042 p = .0291	Child 11 Child 13
t = 2.0467 p = .0426	Child 2 Child 12	t = 2.0467 p = .0426	Child 12 Child 13
t = 3.1488 p = .0020	Child 3 Child 13		

Analysis of Variance Between the Seven Year Olds

Design: One Factor Completely Randomized Design

	Number of Concepts	Mean	SD
Child 1	11	3.36	1.36
Child 2	11	1.91	1.45
Child 3	11	1.00	0.00
Child 4	11	1.73	0.79
Child 5	11	2.91	1.30
Child 6	11	4.45	0.82
Child 7	11	4.00	1.00
Child 8	11	2.91	1.58
Child 9	11	3.91	1.22
Child 10	11	3.64	1.91
Child 11	11	2.18	1.33
Child 12	11	1.00	0.00
Child 13	11	2.91	1.38

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	12	167.7343	13.9779	9.4552	0.0000
Error	130	192.1818	1.4783		
Total	142	359.9161			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .050

t = 2.8056 p = .0058	Child 1 Child 2	t = 3.6823 p = .0003	Child 3 Child 13
t = 4.5591 p = .0000	Child 1 Child 3	t = 5.2605 p = .0000	Child 4 Child 6
t = 3.1563 p = .0020	Child 1 Child 4	t = 4.3837 p = .0000	Child 4 Child 7
t = 2.1042 p = .0373	Child 1 Child 6	t = 2.2795 p = .0243	Child 4 Child 8
t = 2.2795 p = .0243	Child 1 Child 11	t = 4.2084 p = .0000	Child 4 Child 9
t = 4.5591 p = .0000	Child 1 Child 12	t = 3.6823 p = .0003	Child 4 Child 10
t = 4.9098 p = .0000	Child 2 Child 6	t = 2.2795 p = .0243	Child 4 Child 13
t = 4.0330 p = .0001	Child 2 Child 7	t = 2.9809 p = .0034	Child 5 Child 6
t = 3.8577 p = .0002	Child 2 Child 9	t = 2.1042 p = .0373	Child 5 Child 7
t = 3.3316 p = .0011	Child 2 Child 10	t = 3.6823 p = .0003	Child 5 Child 12
t = 3.6823 p = .0003	Child 3 Child 5	t = 2.9809 p = .0034	Child 6 Child 8
t = 6.6633 p = .0000	Child 3 Child 6	t = 4.3837 p = .0000	Child 6 Child 11
t = 5.7865 p = .0000	Child 3 Child 7	t = 6.6633 p = .0000	Child 6 Child 12
t = 3.6823 p = .0003	Child 3 Child 8	t = 2.9809 p = .0034	Child 6 Child 13
t = 5.6112 p = .0000	Child 3 Child 9	t = 3.5070 p = .0006	Child 7 Child 11
t = 5.0851 p = .0000	Child 3 Child 10	t = 5.7865 p = .0000	Child 7 Child 12
t = 2.2795 p = .0243	Child 3 Child 11	t = 2.1042 p = .0373	Child 7 Child 13

t = 3.6823 p = .0003	Child 8 Child 12	t = 2.2795 p = .0243	Child 11 Child 12
t = 3.3316 p = .0011	Child 9 Child 11	t = 3.6823 p = .0003	Child 12 Child 13
t = 5.6112 p = .0000	Child 9 Child 12		
t = 2.8056 p = .0058	Child 10 Child 11		
t = 5.0851 p = .0000	Child 10 Child 12		

Analysis of Variance Between the Eight Year Olds

Design: One Factor Completely Randomized Design

	Number of Concepts	Mean	SD
Child 1	11	3.45	1.57
Child 2	11	3.45	0.69
Child 3	11	3.18	1.08
Child 4	11	3.82	1.33
Child 5	11	2.36	1.12
Child 6	11	4.00	0.89
Child 7	11	3.18	1.66
Child 8	11	2.36	1.12
Child 9	11	2.45	1.04
Child 10	11	3.09	1.87
Child 11	11	4.64	0.50
Child 12	11	3.73	1.10

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	11	58.4470	5.3134	3.5458	0.0002
Error	120	179.8182	1.4985		
Total	131	238.2652			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .050

t = 2.0900 p = .0387	Child 1 Child 5	t = 4.3541 p = .0000	Child 5 Child 11
t = 2.0900 p = .0387	Child 1 Child 8	t = 2.6125 p = .0101	Child 5 Child 12
t = 2.2642 p = .0254	Child 1 Child 11	t = 3.1350 p = .0022	Child 6 Child 8
t = 2.0900 p = .0387	Child 2 Child 5	t = 2.9608 p = .0037	Child 6 Child 9
t = 2.0900 p = .0387	Child 2 Child 8	t = 2.7867 p = .0062	Child 7 Child 11
t = 2.2642 p = .0254	Child 2 Child 11	t = 4.3541 p = .0000	Child 8 Child 11
t = 2.7867 p = .0062	Child 3 Child 11	t = 2.6125 p = .0101	Child 8 Child 12
t = 2.7867 p = .0062	Child 4 Child 5	t = 4.1800 p = .0001	Child 9 Child 11
t = 2.7867 p = .0062	Child 4 Child 8	t = 2.4383 p = .0162	Child 9 Child 12
t = 2.6125 p = .0101	Child 4 Child 9	t = 2.9608 p = .0037	Child 10 Child 11
t = 3.1350 p = .0022	Child 5 Child 6		

Appendix 7.7: Mean Scores for Scaling of Product Ideas for each Age Group

Age Groups	Six	Seven	Eight
Dolls			
Horse	4.25(0.97)a	4.10(1.29)a	3.91(1.51)a
Computer doll	3.75(1.29)abc	3.50(1.43)ab	3.45(1.13)ab
Spray paint doll	3.91(1.24)abc	3.40(1.17)ab	3.18(1.33)ab
Doll/clay accessories	4.00(1.27)ab	3.30(1.70)ab	3.00(1.41)ab
Baby walking doll	3.67(1.67)abcd	3.10(1.60)ab	3.55(1.03)ab
Flexible arm/leg doll	3.83(1.19)abc	3.40(1.26)ab	2.45(1.43)b
Netball doll	3.25(1.71)abcde	2.70(1.64)b	3.30(0.924)ab
Doll with wigs	2.67(1.67)de	3.80(1.14)ab	3.09(1.64)ab
Madonna doll	2.91(1.44)cde	2.80(1.75)b	3.36(1.57)ab
Electronic doll	2.50(1.17)e	2.80(1.81)b	3.00(1.26)ab
Doll with clay body	3.00(1.41)bcde	2.50(1.65)b	2.72(1.27)b

- Note: (1) Scores are on a scale of 1 to 5.
1 = least liked 5 = most liked
- (2) The numbers in parentheses are standard deviations.
- (3) Mean scores within the column followed by a different letter are significantly different at $p<0.05$.

Appendix 7.8 Analysis of Variance of Product Idea Scaling Data

Stat-Packets Statistical Analysis Package

Design: One Factor Completely Randomized Design

	Number of Children	Mean	SD
Netball doll	33	3.12	1.45
Computer doll	33	3.58	1.25
Doll with clay body	33	2.76	1.41
Spray paint doll	33	3.52	1.25
Doll with wigs	33	3.15	1.54
Madonna doll	33	3.03	1.55
Baby walking doll	33	3.45	1.44
Horse	33	4.09	1.23
Electronic doll	33	2.76	1.39
Doll with clay accessories	33	3.45	1.48
Flexible arms and legs	33	3.24	1.39

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	10	49.9008	4.9901	2.5299	0.0059
Error	352	694.3030	1.9725		
Total	362	744.2039			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .100

t = 2.8046 p = .0053	Netball doll Horse
t = 2.3664 p = .0185	Computer doll Doll with clay body
t = 2.3664 p = .0185	Computer doll Electronic doll
t = 2.1911 p = .0291	Doll with clay body Spray paint doll
t = 2.0158 p = .0446	Doll with clay body Baby walking doll
t = 3.8564 p = .0001	Doll with clay body Horse
t = 2.0158 p = .0446	Doll with clay body Doll with clay accessories
t = 1.6652 p = .0968	Spray paint doll Horse
t = 2.1911 p = .0291	Spray paint doll Electronic doll
t = 2.7170 p = .0069	Doll with wigs Horse
t = 3.0676 p = .0023	Madonna doll Horse
t = 1.8405 p = .0665	Baby walking doll Horse
t = 2.0158 p = .0446	Baby walking doll Electronic doll
t = 3.8564 p = .0001	Horse Electronic doll
t = 1.8405 p = .0665	Horse Doll with clay accessories
t = 2.4540 p = .0146	Horse Flexible arms and legs
t = 2.0158 p = .0446	Electronic doll Doll with clay accessories

Appendix 8.1: Questionnaire for Evaluation of Prettiness and Preference of Pony Dolls

HORSES

You have nine horses in front of you.

What five horses are the prettiest?

Write the letters here.

Put the five horse in order of prettiness.

1 _____ Most pretty

2 _____

3 _____

4 _____

5 _____ Least pretty

Why is the horse you have chosen as number 1 the prettiest?

Look at the nine horses again - which horse is the least pretty?

Why do you think this horse is the least pretty?

Look at the nine horses again.

If you could keep six of the horses which six would you keep?

Write the letters here.

Put the six horses in order.

1 _____ Most favourite

2 _____

3 _____

4 _____

5 _____

6 _____ Least favourite

Why is the horse you choose as number 1 your most favourite?

Look at the nine horses.

Which horse is the horse you dislike the most?

Why do you dislike this horse?

Do you have any horse like these at home?

How many do you have?

What is your name _____

What group are you in _____

Appendix 8.2: Form for Card Test for Conjoint Analysis

CARD TEST

Turn your cards over. Write the numbers on the back of the cards in these spaces.

A _____

B _____

C _____

D _____

E _____

F _____

G _____

H _____

I _____

J _____

K _____

What is your name? _____

Appendix 8.3: Individual Ranking Scores From Preference and Prettiness Questionnaires

Preference

CHILD	A*	B*	C*	D*	E*	F*	G*	H*	I*
3		5	4	2	3		6		1
7		1	4	2	6	5	3		
11		1			4	5	6	3	2
12	2		4	1	6	5	3		
13	2	1	5			4	6		3
14			5		4	3	6	1	2
15	3		4	2		5	6		1
16	2		6	1	5	4	3		
18		2	5		3	4	6	1	
19		6	1	3	4	2		5	
20	5	4			2	6		3	1
23	2		4		5	6	3		1
24		5	2	1	4	6	3		
25	6	5	4	3	2	1			
26		3	4			5	6	2	1
27		2		1	4	5	3	6	
28			3	2	1	4	5		6
29	2	3			5	1	4		6
31		1	2	3	6	5	4		
32	2		3	4	1	5	6		
34		5	4	1		2	3		6
35				1	2	6	3	5	4
36			5		3	2	6	1	4
37		1	2	4	3		6		5
38	2		4	3			6	5	1

* See Notes page 315

Prettiness

CHILD	A*	B*	C*	D*	E*	F*	G*	H*	I*
3	1	3		2	4		5		
7			3	1	2	5	4		
11			4			1	5	3	2
12			3	4	5	2	1		
13			4		1	3	5		2
14	3		4				5	1	2
15			3			5	4	2	1
16	1		5		4	2	3		
18		1	4		2	3	5		
19		3	1	5	2			4	
20		2			3	5		4	1
23	2		4			5	3		1
24		4		1	3	5	2		
25	5		4				3	2	1
26		3				4	5	1	2
27		4		1		2	3	5	
28			1	2	4	5	3		
29	2			1	4		3		5
31			1	3	5	2	4		
32	4			2	3	5	1		
34	1	2	4				3		5
35		3			1	4		5	2
36			4		2	1	5		3
37				1	5	4	2		3
38	3		2			4	5		1

* See Notes Page 315

Note (1)	A	Sylviana Horse
	B	Paradise Horse
	C	White Horse
	D	Small Horses
	E	Lipstick Horse
	F	Purple Talking Horse
	G	Brown/White Noise Horse
	H	Baby Horse
	I	Ballerina Horse

- (2) Only the data from children included in the analysis is contained in the tables.
- (3) The scores in the table are ranks given by the children for their most preferred five products and the most pretty six products

Appendix 8.4: Analysis of Variance for Preference and Prettiness Data

Stat-Packets Statistical Analysis Package

Analysis of Variance for Preference Data

Design: One Factor Completely Randomized Design

	Number of Children	Sum of Ranks	Mean	SD
Sylviana Horse	25(10)	28	1.12	1.67
Paradise Horse	25(15)	45	1.80	2.06
White Horse	25(20)	75	3.00	1.89
Small Horses	25(16)	34	1.36	1.35
Lipstick Horse	25(20)	73	2.92	2.04
Purple Talking Horse	25(22)	91	3.64	2.04
Brown/White Noise Horse	25(22)	103	4.12	2.05
Baby Horse	25(10)	32	1.28	1.99
Ballerina Horse	25(15)	44	1.76	2.15

Note: (1) Numbers in parentheses are the number of children that chose each horse

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	8	245.7600	30.7200	8.2507	0.0000
Error	216	804.2400	3.7233		
Total	224	1050.0000			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .050

t = 3.4447 p = .0007	Sylviana Horse White Horse
t = 3.2981 p = .0011	Sylviana Horse Lipstick Horse
t = 4.6173 p = .0000	Sylviana Horse Purple Talking Horse
t = 5.4968 p = .0000	Sylviana Horse Brown/White Noise Horse
t = 2.1987 p = .0290	Paradise Horse White Horse
t = 2.0521 p = .0414	Paradise Horse Lipstick Horse
t = 3.3714 p = .0009	Paradise Horse Purple Talking Horse
t = 4.2509 p = .0000	Paradise Horse Brown/White Noise Horse
t = 3.0049 p = .0030	White Horse Small Horses
t = 2.0521 p = .0414	White Horse Brown/White Noise Horse
t = 3.1515 p = .0019	White Horse Baby Horse
t = 2.2720 p = .0241	White Horse Ballerina Horse
t = 2.8583 p = .0047	Small Horses Lipstick Horse
t = 4.1776 p = .0000	Small Horses Purple Talking Horse
t = 5.0571 p = .0000	Small Horses Brown/White Noise Horse

t = 5.0571	Small Horses
p = .0000	Brown/White Noise Horse
t = 2.1987	Lipstick Horse
p = .0290	Brown/White Noise Horse
t = 3.0049	Lipstick Horse
p = .0030	Baby Horse
t = 2.1254	Lipstick Horse
p = .0347	Ballerina Horse
t = 4.3242	Purple Talking Horse
p = .0000	Baby Horse
t = 3.4447	Purple Talking Horse
p = .0007	Ballerina Horse
t = 5.2036	Brown/White Noise Horse
p = .0000	Baby Horse
t = 4.3242	Brown/White Noise Horse
p = .0000	Ballerina Horse

Analysis of Variance of Data for Prettiness

Design: One Factor Completely Randomized Design

	Number of Children	Sum of Ranks	Mean	SD
Sylviana Horse	25(9)	22	0.88	1.45
Paradise Horse	25(9)	25	1.00	1.47
White Horse	25(16)	51	2.04	1.86
Small Horses	25(11)	23	0.92	1.38
Lipstick Horse	25(16)	50	2.00	1.87
Purple Talking Horse	25(19)	67	2.68	1.99
Brown/White Noise Horse	25(22)	79	3.16	1.72
Baby Horse	25(9)	27	1.08	1.73
Ballerina Horse	25(14)	31	1.24	1.58

Note: (1) Numbers in parentheses are the number of children that chose each horse

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
A	8	141.3600	17.6700	6.2709	0.0000
Error	216	608.6400	2.8178		
Total	224	750.0000			

T-Test Between Cell Means - (Values of p are for a two-tailed test.)

Note: Statistics are only printed if p is less than or equal to .050

t = 2.4432 p = .0154	Sylviana Horse White Horse
t = 2.3590 p = .0192	Sylviana Horse Lipstick Horse
t = 3.7912 p = .0002	Sylviana Horse Purple Talking Horse
t = 4.8022 p = .0000	Sylviana Horse Brown/White Noise Horse
t = 2.1905 p = .0296	Paradise Horse White Horse
t = 2.1062 p = .0363	Paradise Horse Lipstick Horse
t = 3.5384 p = .0005	Paradise Horse Purple Talking Horse
t = 4.5494 p = .0000	Paradise Horse Brown/White Noise Horse
t = 2.3590 p = .0192	White Horse Small Horses
t = 2.3590 p = .0192	White Horse Purple Talking Horse
t = 2.0220 p = .0444	White Horse Baby Horse
t = 2.2747 p = .0239	Small Horses Lipstick Horse
t = 3.7069 p = .0003	Small Horses Purple Talking Horse
t = 4.7179 p = .0000	Small Horse Brown/White Noise Horse
t = 2.4432 p = .0154	Lipstick Horse Brown/White Noise Horse

t = 3.3699	Purple Talking Horse
p = .0009	Baby Horse
t = 3.0329	Purple Talking Horse
p = .0027	Ballerina Horse
t = 4.3809	Brown/White Noise Horse
p = .0000	Baby Horse
t = 4.0439	Brown/White Noise Horse
p = .0001	Ballerina Horse

Appendix 8.5: Reasons for Choice of Most Pretty and Most Preferred Pony Dolls

Note: The words and spelling belong to the children. They have not been altered in any way by the researcher.

Why is the horse you have chosen as number 1 the prettiest?

Brown/White Noise Horse

Because it trlks
because it talks and it is brown and white and it has black hair
because it talks and it makes sounds that galips
It talks white and brown it clicks
Because it looks the prettiest because It makes a nose
Because it makes sounds and I love horses better then my litter ponys
Because it sounds like a real horse and its pretty
I like it Be couse it is the right clour and it can tailk

Purple Talking Horse

because it is pretty It can talk
Because it says im pritty I love you comb my hiir
because she has pink and purple
Because its hair is colurd and becuase it talks
Because my favourite colour is purple
Because my favorite colour is pink

Lipstick Horse

Because it got sparklg hair
I like her hair and I like the colour of her lipstick
its got nice sparkley hair

Ballerina Horse

I like the I horse because its got a ballet dress
Becuase it is purple and has clips in her hair and is very pretty

Baby Horse

Because it is cute and small and is so much like a baby pony
Becuase it is small and very very cute

Sylviana Horse

because it is very very very very very very cute

White Horse

Because it looks like a nice pony Nice colours lokks like a real pony

Small Horses

Because their little and cute and becuase they have got nice hair
they are small and pretty clours

Why is the horse you choose as number 1 your most favourite

Brown/White Noise Horse

Because it trlks
Because it talks and it is black and white
because its a nice horse and it talks
like the hair/legs
because it goes naie naie naie naie
because it is the best because it is My favuen coluor
because it makes sounds and I love hourse better then my litter ponys
because it sounds like a real horse
cause it looks like a real horse
Be couse I like how It talks
it is pretty and makes nosie

Purple Talking Horse

becaus it has pink and pulple
because it talks becuase its hair is different
because my favourite colour is purple
because purple is my favarite coler

Lipstick Horse

because the horses are pretty and I hug did
because its beutiful and sparkly
because I like pretty sparkey hair lipstick

Ballerina Horse

because I do Ballet

I like the horse because it got a yellow hair and a ballet dress

Because it has bows in its hair and is pretty

Baby Horse

Because it is cute and I like its colour and hair and the way it looks

Sylviana Horse

because its got a saddle on it and a hat and cute

Paradise Horse

because it is cute and bright

White Horse

because looks like a real horse Beautiful horse

Appendix 8.6: Reasons for Choice of Least Pretty and Least Preferred Pony Dolls

Note: The words and spelling belong to the children. They have not been altered in any way by the researcher

Why do you think this horse is the least pretty?*Sylviana Horse*

Don't like brown
its ugly!!!
becuase it is very ugly and horrible
becuase it is very very very very ugly and horses don't have hats
Because it is pretty plain I don't like white hair and becuae of its colour
because it looks old and tatty
becuase it is very very ugly

Ballerina Horse

Because I hate it ugly cant talk and haven't got a key to open
becuase it looks ugly and sweet
because Its a ballet and I don't like ballet
It looks too posh looks rude Dressed too nice
I is dumb because it is old
because it is to curly and it is horrible
because I don't like the colour of her hair

Paradise Horse

because it is a ugly horse becuae of the colour
Be couse it is ourang and I hate that clour
The colour

Lipstick Horse

because it has dangling haior and its hair falls down
because its hire falls out and keet falling down
Because it is pink and has blue hair

Baby Horse

I Grst like it I Gast hate it it ugly
it has bright hair and it is messy

Small Horses

becuase there are only little horses
The little horses doesnt look very pretty becuase their got a long hair and
thier are small

White Horse

because it is brown and whit

Why do you dislike this horse?*Sylviana Horse*

Don't like the little one
because it is old and tatty
Because I think it is very very very very very ugly and house don't have hats
Because its ugly and I hate its hair colour and also the colour because I hate
brown
Because it is ugly
because I don't like brown
Because its ugly!!!

Ballerina Horse

I hate the horses can't talk
because its ugly
It looks too posh looks rude Dressed too nice
because it is bumb
because it hair is to curly and because it is ugly it is horrible
because it is so so so ugly and horrible
because I don't like anything about her

Paradise Horse

because it ugly
The colour
Because its got a colour that I don't like
Be couse it is ourng and I hate that clour

Lipstick Horse

because its hair falls out
because its hier falls out

Baby Horse

Its ugly
it is aple

Small Horses

because its little

White Horse

because it has brown and white hirr

Talking Horse

because it's a blaber mouth

Appendix 9.1: Final Product Concepts for Multidimensional
Scaling Questionnaire

HORSE 1

This horse is very large. It is large enough for you to sit on. The horse can talk to you if you push a button. It comes in pale colours like purple, blue, pink and yellow. This horse can move its legs and head using some controls on the top of the horse.

HORSE 2

This is a very pretty horse. It has long hair and comes with makeup that you can put on the horse. It has a beautiful saddle and jewels (earrings, rings and a crown). This horse looks like a princess.

Appendix 9.2: Multidimensional Scaling Scoring Sheet

Are These Horses the Same?

Put a circle around the letter which shows how much the same you think these horses are.

	Same				Not the Same		
Purple Talking Horse							
Brown & White Noise Horse	1	2	3	4	5	6	7
White Horse							
Purple Talking Horse	1	2	3	4	5	6	7
Horse 1							
Brown & White Noise Horse	1	2	3	4	5	6	7
Brown & White Noise Horse							
Ballet Horse	1	2	3	4	5	6	7
Horse 2							
White Horse	1	2	3	4	5	6	7
Purple Talking Horse							
Horse 1	1	2	3	4	5	6	7
White Horse							
Ballet Horse	1	2	3	4	5	6	7
Horse 2							
Horse 1	1	2	3	4	5	6	7

	Same			Not the Same			
Ballet Horse							
Horse 1	1	2	3	4	5	6	7
Brown & White Noise Horse							
Horse 2	1	2	3	4	5	6	7
Horse 1							
White Horse	1	2	3	4	5	6	7
Ballet Horse							
Purple Talking Horse	1	2	3	4	5	6	7
Horse 2							
Purple Talking Horse	1	2	3	4	5	6	7
White Horse							
Brown & White Noise Horse	1	2	3	4	5	6	7
Ballet Horse							
Horse 2	1	2	3	4	5	6	7

Note: Originally this sheet was in 16 point but has been reduced to 13 point to fit.

Appendix 9.3: Individual Scores for Multidimensional Scaling

PRODUCT PAIRS*																
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
CHILD																
1	4	7	1	4	3	4	6	5	4	4	1	2	1	1	1	
2	7	7	7	7	7	7	7	7	6	6	4	5	3	5	2	
3	4	7	7	7	6	5	5	6	7	7	7	7	7	7	6	
4	6	5	4	6	6	6	6	6	5	6	4	3	3	3	3	
5	7	7	7	7	6	7	7	7	6	6	4	5	3	5	2	
6	6	5	3	7	3	4	6	5	6	2	4	2	3	4	2	
7	6	7	7	6	5	7	5	7	5	7	5	5	7	5	7	
8	7	7	7	6	2	1	7	5	4	1	7	4	7	2	5	
9	4	7	6	5	7	4	7	7	7	4	4	6	6	7	5	
10	1	1	3	6	1	5	1	2	3	1	1	4	2	6	1	
11	7	7	7	4	4	6	6	5	7	4	5	6	2	3	7	
12	5	7	3	6	7	4	7	6	3	6	6	5	6	4	2	
13	4	7	6	7	5	7	4	6	6	6	4	4	6	3	2	
14	4	7	7	7	7	5	6	4	3	7	6	1	3	1	3	
15	6	7	6	7	7	6	7	7	6	6	6	5	6	1	7	
16	3	6	7	5	6	7	5	6	6	5	6	5	6	5	6	
17	4	6	4	5	4	1	4	4	4	1	4	3	3	4	4	
18	7	6	5	6	6	7	7	6	6	6	5	5	4	2	3	
19	4	6	3	6	7	5	7	7	5	6	5	1	4	2	4	
20	7	7	7	7	7	6	7	7	7	7	7	6	4	2	5	
21	7	7	7	7	7	7	7	7	7	7	7	4	6	2	5	
22	7	7	7	7	7	4	7	7	7	7	7	7	7	3	4	

* See Note page 333

PRODUCT PAIRS*															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
CHILD															
23	7	7	7	7	7	6	5	7	4	6	5	5	5	5	5
24	6	7	6	6	7	6	6	5	7	6	7	7	6	4	6
25	6	7	6	7	6	6	6	7	6	6	7	7	6	2	7
26	4	4	5	7	6	4	7	5	4	6	7	3	5	1	6
27	7	6	7	7	7	7	5	2	4	7	7	6	4	3	2
28	3	7	7	2	7	5	4	7	6	7	2	4	7	6	4
29	4	7	1	4	7	1	4	7	1	4	7	1	4	7	1
30	4	7	4	7	7	7	7	7	7	7	4	7	7	4	7
31	5	3	7	4	6	6	2	1	6	4	4	2	6	4	3
32	4	3	7	1	4	1	1	2	1	1	7	1	1	1	1
33	7	7	6	7	7	6	5	6	5	6	4	5	6	3	5
34	3	5	4	7	6	1	5	3	2	7	4	4	6	1	4
35	7	7	7	7	7	7	7	7	7	7	7	6	7	7	7
36	4	7	7	7	7	4	6	7	7	7	7	7	7	7	7
37	4	3	4	7	7	7	7	7	7	4	7	7	7	5	7
MEANS	5.2	6.1	5.6	6.0	5.9	5.1	5.6	5.6	5.2	5.3	5.3	4.5	4.9	3.7	4.

Note: Pairs of "Pony Dolls" Tested

- A = Purple Talking/Brown and White
- B = White/Purple Talking
- C = Horse 1/Brown and White
- D = Brown/White/Ballet
- E = Horse 2/White
- F = Purple Talking/Horse 1
- G = White/Ballet
- H = Horse 2/Horse 1
- I = Ballet/Horse 1
- J = Brown and White/Horse 2
- K = Horse 1/White
- L = Ballet/Purple Talking
- M = Horse 2/Purple Talking
- N = White/Brown and White
- O = Ballet/Horse 2

Appendix 9.4: Data File Used to Analyse Multidimensional Scaling Data

```
TORSCA
PRE-ITERATIONS=3
DIMMAX=5,DIMMIN=1
COORDINATES=ROTATE
CARDS
ITERATIONS=50
REGRESSION=ASCENDING
DATA,LOWERHALFMATRIX,DIAGONAL=ABSENT
HORSES
  6 1 1
(6F4.2)
5.2
6.1 3.7
4.5 6.0 5.6
5.1 5.6 5.3 5.2
4.9 5.3 5.9 4.3 5.6
COMPUTE
STOP
```

Appendix 9.5: Example of Final Product Concept for Preference
 Questionnaire

HORSE R

This is a very pretty horse. It has long hair and comes with makeup that you can put on the horse. It has a beautiful saddle and jewels (earrings, rings and a crown). This horse looks like a princess.

Appendix 9.6: Preference Questionnaire for Product Concepts

HORSE CONCEPT TESTING

1. Which horse do you like the best?

Letter_____

2. Put the five horses in order.

Best _____

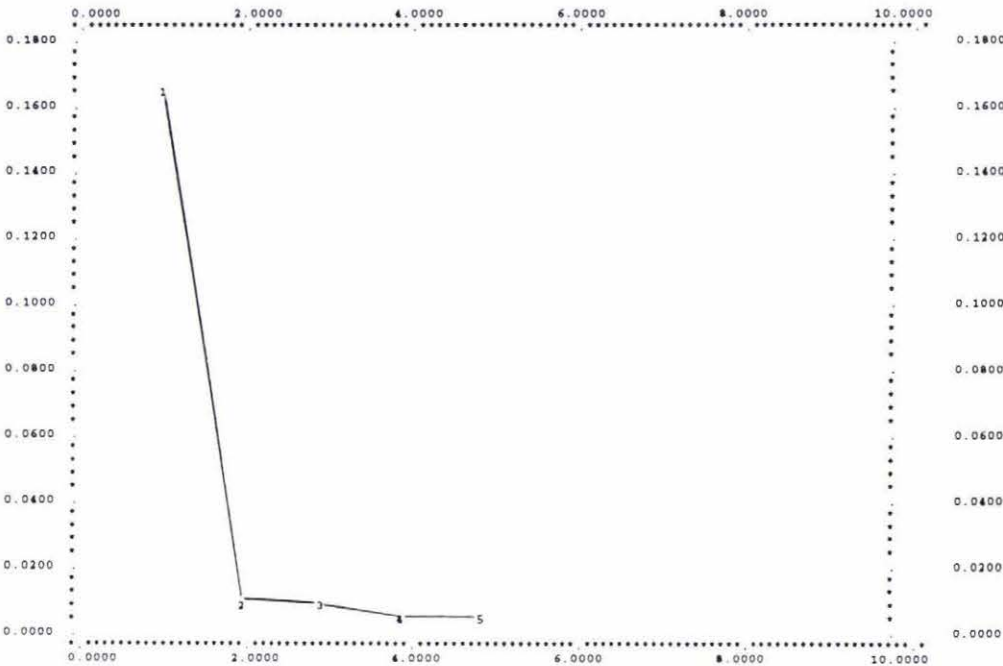
3. If you could have one of these horse which one would it be?

Letter_____

4. If you could have one of these horses which one would it be?

Letter_____

Appendix 9.7 Plot of Stress versus Dimension



Appendix 9.8 History of Computation

History of Computation. N= 6

There are 15 Data values, split into 1 lists. Dimension = 2

Iteration	Stress	Srat	Sratav	Cagrgl	Cosav	Acsav	Sfgr	Step
0	0.100	0.800	0.800	0.000	0.000	0.000	0.0113	0.0281
1	0.081	0.811	0.804	0.998	0.659	0.659	0.0089	0.0756
2	0.037	0.462	0.668	0.888	0.810	0.810	0.0027	0.2231
3	0.040	1.081	0.784	-0.404	0.008	0.542	0.0047	0.1816
4	0.028	0.698	0.754	0.992	0.658	0.839	0.0030	0.0411
5	0.014	0.511	0.663	-0.219	0.079	0.430	0.0011	0.0344
6	0.011	0.738	0.687	-0.390	-0.231	0.404	0.0011	0.0254
7	0.007	0.696	0.690	-0.908	-0.678	0.737	0.0007	0.0108

Satisfactory stress was reached

The final configuration has been rotated to Principal Components.

The final configuration of 6 points in 2 dimensions has Stress 0.007 formula

Appendix 9.9 Goodness of Fit Plot

ist(d) and Dhat(-) (y-axis) vs. Data (x-axis), for 2 dimensions.

