THE COMPETENCY OF CHILDREN AS EYE WITNESSES: THE EFFECT QUESTION ORDER HAS ON THE ACCURACY OF RECALL.

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DECLARATION

The entire dissertation, unless specifically indicated to the contrary in the text, is the author's own original work.

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ABSTRACT

The child's role as an eye witness has received a great deal of attention over the last decade. The current debate regarding the competence and credibility of child witnesses is being addressed by both the Legal and Psychological fields.

This research focuses on establishing if a relationship exists between the order of the questions and the accuracy of recall. Children aged six and seven were questioned using a variety of protocols about an incident which they had witnessed.

The research question is discussed within the broad theoretical area of children as eye witnesses. Highlighted is the burgeoning research in the area, which evidences conceptual confusion and conflicting results. The processes involved in memory, encoding and retrieval are discussed in relation to the broader area.

Factors affecting reliability such as suggestibility and vulnerability of the child as a witness are discussed. Methods of interviewing children are investigated within a developmental framework. Suggestions are made as to how the reliability of children's testimony may be enhanced by the interviewing process.

The results of this study indicated that the order in which questions were asked did not have a significant effect on the accuracy of recall of this sample of children aged six and seven. The limitations of this study were noted and a descriptive account of the children's responses was discussed. This discussion concludes that a need for further research still exists in this area. In addition particular emphasis should be directed towards how children, within the

broader context of the interviewing process, respond so that future research may produce more rich and reliable information about child witnesses.

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CHAPTER 1

INTRODUCTION

The child's role as a witness has received a great deal of attention recently as children are found more and more within the legal arena, as cases of child abuse or custody disputes increase.

There has been a substantial increase in the reporting of sexual abuse cases over the years resulting in the increased need for children to act as witnesses. This according to Meyer and Geis (1994) reflects a growing awareness of the need to focus on an area of research which has been overlooked in the past. With child witnesses acquiring a higher profile over the past decade it is understandable that the psychological and legal perspectives have fused, as special considerations are necessary for child witnesses. According to Wolfe, Sas and Wilson (1987) this has placed a tremendous demand on community systems to protect child witnesses, as children are having to testify in the criminal justice system which was not designed for them.

If the child's voice is to be heard and believed, a greater understanding is needed of what factors influence the child's ability to give accurate accounts of events witnessed by them. Factors such as the child's age and developmental stage; the trauma involved in the events; the circumstances under which the event was witnessed; and the type of questioning used, all influence the accuracy of recall.

According to Myers (1993) attention should be paid to the interviewing of child witnesses by social workers, police officers, physicians and others, as in numerous cases attorneys attempt to discredit the child witness on the basis of the interview methods used.

Fouché and Hammond support this notion and state that there is "a serious need for better guidelines for conducting interviews with children" (1987, p.72). As a result of poorly planned interviewing techniques, children are asked, in repeated interviews, to recall the events which were witnessed. This may serve only to confuse and increase the trauma of the child witness. Van Dokkum, (1995) suggests that the child may suffer a from of 'secondary victimisation' as a result of an appearance in court. It is therefore necessary to pay close attention to the interviewing process not only to improve accuracy of recall but also to reduce the possibility of secondary trauma. Careful attention should be paid to the process of information retrieval in order that repeated interviewing of children may be avoided.

Fouché and Hammond (1987) state that crimes against children are among the easiest to get away with for two fundamental reasons, namely, children are assumed to be incompetent witnesses and they are perceived as being vulnerable.

While it is commonly believed that children take in and retain information as well as adults do (Fouché and Hammond, 1987) children find it difficult to retrieve information spontaneously. The questioning techniques used within the interviewing process are therefore of importance in improving the accuracy of children's testimony so as to enhance their competence and credibility as witnesses.

It is difficult to destroy long standing myths about children's credibility. Past research suggested that children have poor memories (Marin, Holmes and Guth et al, in Benedek and Schetky, 1986), children confuse fact and fantasy (Stern, in Benedek and Schetky, 1986), and that children are more suggestible than adults (Marin, Holmes and Guth et al, in Benedek and Schetky, 1986). These issues are currently being debated and will be elaborated on in the course of this dissertation.

In order to contextualise these issues, two central concepts will be discussed, namely, the competence and the credibility of child witnesses. Melton (1981) suggests that these two interactive issues are core issues as they relate to the psychology of memory, suggestibility, confabulation, fabrication and moral development and the legal necessity of determining if a child can be regarded as a competent and credible witness. The issues have stimulated much debate from both the legal and psychological arenas.

This study argues that the competence and credibility of child witnesses will be partly determined by the interviewing process, in particular, the order in which age appropriate questions are asked of child witnesses. The present research was undertaken to highlight the need for careful attention to be paid to the interviewing process with particular emphasis on questioning techniques. Methods to improve the accuracy of recall were also investigated. The focus of the research was to examine, under controlled conditions, the assumption that an event which is witnessed by children would be stored, comprehended and encoded according to the sequence of events in which they occurred. It was hypothesised that the accuracy of the retrieval of this information would be enhanced if the cognitive process initiated by the questions matched the temporal order of the memory trace.

While it has become common to question the child's ability to be a reliable witness, not much attention has been paid to understanding why childrens' accounts of events may be less accurate than older persons. Morris and Morris's (1985) study in which adult subjects were used set out to determine whether the order in which questions were asked influenced their accuracy of recall. Their results were positive and suggest that the witnesses memories can be appropriately reconstructed. The present study undertook, using the framework of the Morris and Morris study, to evaluate the effect of question order on the reliability of recall in children. In this study children are regarded as being cognitively competent, (Fouché and Hammond, 1987). However the process of retrieval of information is regarded as being a vital link in the credibility of childrens' recall.

The reliability of child witnesses has received attention from two perspectives, the legal and the psychological. Heydon (1984) suggests that from the legal perspective children's testimony may be regarded in a suspicious light for the following reasons.

1. A child's powers of observation and memory are less reliable than that of an adult.
2. Children live in a "make believe world", and therefore magnify incidents or invent incidents.
3. Children are egocentric and therefore details unrelated to their own world are forgotten.
4. Due to their immaturity they are suggestible and therefore influenced by adults or other children.
5. Children have little notion of the duty to speak the truth.
6. Children sometimes behave in a way evil beyond their years and may, for

example consent to sexual offenses against themselves and then deny consent.

From a more psychological point of view a number of psychological factors such as: **cognitive communication; developmental deficits; memory retrieval and potential emotional distress,** contribute towards the reliability and accuracy of recall by children. This highlights the necessity to consider both the age and cognitive stage as they relate to the child's ability to reliably recall details.

A number of pertinent issues are raised with regard to the reliability of children as eye witnesses, namely: suggestibility, egocentricity, fact from fantasy. It is necessary within the developmental perspective to ascertain how they influence the accounts given by child witnesses. Research has highlighted the conflicting ideas in this area, for example, Westcott and Davies (1993) are of the opinion that children are highly suggestible and lacking in competence as witnesses. Goodman (1984) is of the opinion that research into suggestibility with child witnesses has methodological flaws and has resulted in a negative bias against children as witnesses.

Dale, Loftus and Rathbun (1978) suggest that children have always been regarded as inaccurate, highly suggestible and unreliable witnesses. Due to this uncertainty a flurry of research has been prompted which is constantly raising the question of the inaccuracies of eye witness testimony by children. Morris and Morris (1985) are of the opinion that research should shift in focus from looking at factors contributing to inaccuracy of recall to looking at practical methods of improving the accuracy of the witness's recall. A need therefore exists to investigate those methods of questioning that may reliably reconstruct the child witness's

memories.

Research, therefore, needs to focus on the accuracy of recall as a product of the type of interviewing or questioning technique that is used. According to Meyer and Geis (1994) past research focusing on the accuracy of a child's testimony has indicated that question wording and interview context are responsible for some of the variances in children's answers to questions. Following the Morris and Morris study it is the question wording and in particular the question order which is of particular interest in this research.

Good initial questioning could prevent the child from having to go through the process of repeated questioning which further causes trauma and doubt about his\her first testimony.

The goal of this dissertation is to highlight the need for more appropriate questioning of child witnesses so as to facilitate their accuracy of recall and to minimize the variances observed in children's testimony. By enhancing the competence of child witnesses it is hoped that their credibility will likewise be enhanced.

In summary, the competence and the credibility of children as witnesses within the legal arena is an issue requiring urgent attention as children are increasingly being called upon to testify. In this study the retrieval of information through the interviewing process is regarded as the vital link between competence and credibility. A child's testimony will be the product of the dynamic interplay between the interviewer and the child. In **Chapter Two** of this thesis the current literature and research relating to memory retrieval for events is critically evaluated. This chapter deals with a number of issues, namely: competence and credibility; memory;

reliability; suggestibility and vulnerability; fact and fantasy; egocentricity and finally the methods of interviewing child witnesses. This will give us a clear understanding of the relevant areas of concern which are currently being debated as they pertain to the improved reliability of child witnesses. **Chapter Three** outlines the present research in which it is hypothesised that accurate retrieval of information could be achieved if the cognitive process initiated by the questions matched the structure of the memory. In **Chapter Four** the results are analyzed to determine whether or not they are significant. **Chapter Five** offers a discussion of the findings of this research in the light of the literature reviewed and within a developmental framework. Some suggestions are proposed for future research in the area. The **Final Chapter** draws together the pertinent issues raised and debated in this research.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A great deal of attention has been focused on children's ability to be accurate eye witnesses. Much of the research which has been undertaken has focused on various aspects of recall so as to determine how children will respond under certain circumstances within the context of the developmental trajectory of credibility. The current shift in focus of research illustrates the necessity to address the methods of interviewing as a crucial link between retrieval and the accuracy of recall.

On reviewing this research Goodman and Michelli (1981) concluded that many pertinent questions remained unanswered:

1. How does a child's understanding of the judicial system effect performance on the stand?
2. What type of questions best elicit a valid answer from a child?
3. Is a child witness likely to be accurate about some kinds of events but not about others?

Goodman and Michelli (1981) suggest that they suspect that in some cases children are more accurate witnesses than adults. The questions highlighted by them raise a number of issues which will be elaborated on in the course of this paper. Given the rapid changes that occur as the child develops, it is necessary to specify the age as it pertains to the developmental stage the child is in when considering the reliability of the child witness. Regarding

"accuracy" of the witness, research with children suggests they attend more to central details of actions as shown in films. Non relevant information such as what people wear is not recalled (Wright and Vlenstra; Collins, Wellman, Kenistan and Westby in Johnson and Foley, 1984). The issue regarding what type of question is preferable, in order to elicit a valid response from a child witness, is the focus of this dissertation in that the appropriateness of the wording of questions and the order in which they are asked can significantly effect the process of retrieval.

The literature on children's eye witness testimony is full of contradictions with developmental trends in accuracy, suggestibility and response to stress differing from study to study. Discrepancies have prompted critics to argue that eye witness research lacks cohesion as a suitable developmental approach has not been adopted. In recognizing the importance of developmental differences which effect the child witness a number of areas of concern are raised:

Firstly, the child's ability to give an accurate and complete account of events witnessed. This raises the question of the child's competence to testify as it relates to the perception of the child as a credible witness in the psycho-forensic arena. In order to conceptualize this it may be useful to explore the process of memory with particular reference not only to the acquisition and retention stage but particularly to the retrieval stage. Also raised are the issues that children, as opposed to adults, are less reliable witnesses because of their developmental levels in certain areas, such as their inability to distinguish fact from fantasy, their egocentricity and their vulnerability to suggestion.

Secondly, the methods used for retrieving information highlight the need for careful attention to be paid to the role of the interviewer. The methods of interviewing child witnesses needs to be addressed paying close attention to the questions, the order of questions, the form and content of the questioning and the sensitivity of the interviewer. This central issue still requires additional research.

There is very little consensus regarding the precise age at which a child is regarded as being competent. Benedek and Schetky (1986) suggest that a child's competence depends on the child's intellectual capacity, his appreciation of the difference between truth and falsehood, and his duty to tell the former.

Even when the child's competence has been established the child's credibility may then be questioned. These central issues will be addressed in greater detail in this review.

2.1.1 COMPETENCE AND CREDIBILITY OF CHILD WITNESSES

The competence and credibility of the child witness are not only determined legally but are used by defense attorneys to discount the testimony of the child witness. It is therefore of importance to draw a distinction between the terms Competency and Credibility.

Competence, pertains to the child's general capacity to observe, recollect and communicate the truth. The trial judge has the power to determine a witnesses competence or to prevent the child from testifying if they do not meet the minimal standards of competence.

Credibility, on the other hand, refers to the believability of the child witness. It is argued that a child who meets the legal criteria for competence may not necessarily be a credible witness. Let us consider each in turn in more detail.

Competence has been researched in laboratory settings which have shown that children as young as three and six years of age have fulfilled the criteria of competence. Legally there is a presumption that children are incompetent to testify, however Melton, Petrila, Poythress and Slobgin (1987) suggest the age up to which children are generally seen as incompetent varies from seven to ten years. This suggests that from the legal perspective, children, below a certain age, are less likely than adults to give reliable testimony. It further suggests that the competency of child witnesses of any age should be established for each case and it should be determined whether the testimony of the child will further enhance justice. In determining competency to testify, according to Melton, Petrila, Poythress and Slobgin (1987) courts tend to focus on the child's ability to:

* differentiate fact from fantasy
* comprehend the duty to tell the truth
* and to understand the consequences of not fulfilling this duty.

The above abilities imply that adherence to the truth is an essential criteria however it is not sufficient to establish competency. It is furthermore necessary for the witness to have cognitive skills which are adequate to comprehend and understand the event and to communicate the memories, or recall the information in the response to questions at the time of trial. Therefore the child is required to be able to organize the experience that he\she has witnessed cognitively and to furthermore differentiate it from other thoughts and fantasies. In assessing the child's competency to testify it may be necessary to assess the child's cognitive, moral, and emotional capacities, treating each case individually . This highlights the necessity to keep a developmental perspective in mind when dealing with children as witnesses, in addition to assessing the unique circumstances and the individual child.

Saywitz, Nathanson and Snyder (1993) focused on the role of communicative competence and the credibility of child witnesses. They suggest that a child's lack of credibility has as much to do with the competence of adults to relate and communicate through the interviewing process with children as it does with the child's ability to remember and relate their experiences accurately.

Communicative competence is defined as:

> "the ability of adults to elicit, and of children to provide, reliable information, in a question-answer format, about a potentially traumatic autobiographical event, an event of which the adult has no firsthand knowledge but likely does have preconceived notions based on information provided by others".
>
> (Saywitz, Nathanson and Snyder, 1993, p.59).

There is an interplay between the interviewer and the child witness. **Firstly**, the interviewers communicative competence is judged to be, the ability to question in an unbiased manner at the appropriate level for the child in order to gain valuable information. This will give the child a fair chance to give an accurate account of events witnessed.

Secondly, the child's communicative competence is determined by the child's ability to translate memories into language; to deal with non-comprehension; to reason and to distinguish fact from fantasy. Communication failures can, according to Saywitz Nathanson and Snyder, "obscure the fact-finding process and derail the course of justice" (1993, p.60). This further serves to illustrate the importance of the interviewing process.

In summary, competence according to Haugaard is judicially determined on the following 4 grounds:

1. The child's understanding of the difference between truth and falsehood together with an understanding of the responsibility to speak the truth on the witness stand.
2. The child's capacity at the time of the crime to accurately perceive the events.
3. The child having sufficient memory capacity to retain an independent recollection of the events.
4. The child's capacity to translate the memory into words and to be able to answer simple questions about it.

(Haugaard 1988, p.103).

Credibility on the other hand refers to the believability of the child witness which is determined by the jury on a number of factors other than the child's general capacity, veracity, bias, perception and memory of the particular event. This fine distinction means that a child may be competent to testify but is not a credible witness (Haugaard, 1988).

Undeutsch (1982), suggests that it is important that two components of credibility are identified; **Firstly**, there is the cognitive ability of the child to give evidence. **Secondly**, there is the motivation or willingness to give evidence. These two components would serve to increase or decrease the child's credibility, this however, remains a debatable issue. Fouché and Hammond suggests that during cross examination the "child's credibility is deliberately broken down in lines of argument that are designed to confuse and upset," (1987, p.11).

In conclusion the following factors may be used in determining trustworthiness or credibility of child witnesses:

1. The age of the child.
2. The nature of the abuse.
3. The relationship between victim and offender.
4. The qualifications of the declarant.
5. The nature of the statement (written or oral).
6. The motivation of the declarant.
7. The circumstances under which the child's statement was made.

(Myers, 1986, p. 214)

As discussed above, competence is determined by a number of factors, one of which being the child's capacity to perceive, retain and recollect the memory of the witnessed event. The retrieval of the information may be facilitated if the interviewer provides a clear and logical structure to their questions thus facilitating the retrieval process. In order fully to understand competence and credibility of child witnesses it will be necessary to look in more detail at the encoding and retrieval processes involved in memory.

2.2 MEMORY

2.2.1 INTRODUCTION

In July 1977 a fatal plane crash killed eight people aboard the aeroplane and one bystander. Sixty eyewitness were interviewed, revealing that only two people actually saw the aeroplane just before impact. One was quoted as saying that the aeroplane was "diving" and heading right towards the ground "face down". Photographs of the crash revealed that the aeroplane

hit the ground at a low horizontal angle and proceeded to skid almost 1000 feet. This serves to illustrate the potential problem posed by evidence provided by eye witnesses due to the influence of memory processes when we acquire, retain and retrieve information. These memory processes hamper scientific and legal institutions in attaining the goal to distinguish the truth (Raskin, 1989). This raises the question of the **accuracy** of eye witness testimony.

A further question which requires consideration with child witnesses is whether or not they can be considered to be trustworthy. **Trustworthiness** is a complex concept which involves the child's power of observation, that of recollection and the ability to communicate the specific event to the interviewer. The child's capacity to observe the incident may depend on whether or not he\she is intelligent enough to observe. Recollection may depend on his age and discretion to remember what occurred and the ability to communicate. The question is therefore raised as to whether the child has the ability to understand the question as well as the ability to retrieve the information which was stored at the time of witnessing the incident.

When a child is required to testify in a criminal case it is necessary not only for the child to have a memory of the past event, but it is furthermore necessary for the child to translate these memories, once retrieved, into verbal responses which need to be communicated to the interviewer. This is a very complex cognitive process. Research has shown that most of the cognitive skills used in memory recall develop between the ages of five and ten years. A child not yet skilled in memory simply has not yet learned how to recall that memory at will (van Dokkum 1995).

Looking at the processes involved in memory it is generally agreed that two types of memory are identified namely **episodic** and **semantic** memory. **Episodic** memory is an automatic storage and reproduction of spatially located, temporally ordered personal experience. This is therefore, the memory for incidents or episodes. **Semantic** memory coexists with cognitive storage and utilization of words, symbols rules and concepts. This constitutes our general knowledge and what we know about the world. With maturation a child acquires more efficient strategies for recording, storing, recalling and reproducing episodic memory. Adults appear to organise their memory semantically, they remember things in a logical and coherent fashion. As hierarchically organized cognitive structures develop semantic memory becomes more complex with the stages of development. It is important to note that episodic and semantic memory are interactive.

Other important features of memory to note are the registration and storage capacity of memory. In order for the child to understand the duty to tell the truth the child must possess the mental capacity at the time of the occurrence to observe and register the event accurately (**registration memory**), the memory sufficient to retain an independent recollection of the event (**storage capacity**), the ability to communicate this memory (**recall and communication**), in addition to the ability to understand one's obligation to speak the truth (Benedek and Schetky, 1986). Johnson and Foley (1984) do not believe that age has any influence over the long-term retention of details, they furthermore suggest that children are competent when asked to relate the frequency with which an event occurred and are able to recall the temporal order of events.

Additional processes involved in memory entail **short term** memory which has a low capacity and short duration and **long term** memory which is a more permanent record of past events. The durability of memory depends upon the transfer of information from short term memory to long term memory involving processes of storage, retention and retrieval.

As there is substantial agreement that eye witness reports can be biased or distorted at the retrieval stage, how the information is elicited from a witness is critical. The encoding and retrieval process will now be explored further.

2.2.2 ENCODING AND RETRIEVAL PROCESSES

Memory processes can be divided into three major stages:

A) **The acquisition stage**: in this stage the event is perceived by a witness and the information is entered into the memory system.

B) **The retention stage**: here information is stored as time passes before the event has to be recalled.

C) **The retrieval stage**: during this stage the witness tries to recall the stored information.

Let us elaborate on each of these three stages in more detail.

2.2.2.1 THE ACQUISITION STAGE

During this stage information about an event is perceived by the witness. The duration of the event may vary. There are numerous factors which influence the quality of the information stored. It is generally understood that the factors which influence the quality of stored information can be identified as factors inherent in the **event** and factors inherent in the **witness**. Each of these will be discussed more fully.

2.2.2.1.1 FACTORS INFLUENCING THE QUALITY OF STORED INFORMATION

Research in this area has illustrated how factors inherent in the event such as the time of day; duration of the event and violence can influence the accurate recall thereof.

2.2.2.1.1.1 EVENT FACTORS

The **lighting conditions** may effect the quality of the stored information. Visibility, evening versus daytime will effect the quality of information stored. Yarmey (1979) tested whether people see better in good light than in poor light, better during the day than night, and concluded that free reports were more accurate under daylight and at the start of twilight conditions than those at the end of twilight and night conditions.

The **duration** of an event may further influence the quality of the stored information. It is commonly accepted that the longer a person looks at an event the better their memories are of the event. Duration of an event is however a more complex issue. Recall of fast moving and complex events usually results in an overestimation of duration. Information about speed and distance may be required in cases of automobile accidents. Research pertinent to such factors has revealed some of the following information. Cattell (in Loftus, Greene and Doyle, 1989) found that subjects were inaccurate and over estimated the distance between two buildings. Leibowitz (1985) found that large objects appeared to be moving more slowly than smaller objects. The length of observation times results in greater correspondence between accuracy and confidence of recall (Bothwell, Deffenbacher, and Brigham, 1987). In addition emotional context also has an effect, for example, Clifford and Hollin (1981) looked at the violence of an event as a determinant of accuracy of storage, their results showed that accuracy of testimony was consistently poorer in violent conditions.

The variety and extent of research in this field illustrates how event factors can influence the accuracy of recall and how many of these factors may interact to confound the recall of an event. In addition how the witness experiences the event will also be of significance.

2.2.2.1.1.2 WITNESS FACTORS

Factors inherent in the witness which effect perception and therefore the registration of an event are explored. Research has indicated that the level of stress and anxiety experienced by the witness will have an impact on the accuracy of recall. It is important to note the role that **stress** plays at the time a witness experiences an event. For example, Yerkes and Dodson (in Loftus, Greene and Doyle, 1989) suggest that the level of performance will sometimes be improved and sometimes lowered by the increase of stress. They further suggest that there is an optimal level of stress at which performance is at it's best. This would depend entirely on age and individual differences. Different people may witness the same event but experience it in a completely different way. As a result the level of anxiety experienced may vary from individual to individual.

The anxiety caused by the event in the personal context of the witness also needs to be taken into account. Siegel and Loftus (in Loftus, Greene and Doyle, 1989) found that people who have undergone a **number of recent negative life changes** (death of a close friend or loss of a job) show deficits in memory. It is postulated that chronic stress causes a preoccupation so that individuals do not pay adequate attention to cues in their environment.

As previously noted, the **age** of a witness can effect the reliability of the testimony. Studies comparing children to young adults and others comparing elderly to young adults have

demonstrated the affect of age on reliability of recall. This emphasises the need to adopt a developmental approach to understanding the recall of events. When considering children, other important factors come into play. For example the age of the child and the type of question asked. These issues will be dealt with at a later stage.

In conclusion, the factors effecting the recall of an event at the acquisition stage are many and varied. The way in which an event is experienced during the acquisition stage by the individual will, according to research, effect the later recall of an event. In turning our attention to the retention stage of memory, it will be seen that factors involved in this process will also effect the accuracy of recall.

2.2.2.2 THE RETENTION STAGE

Forgetting may be as a result of processes involved in the retention stage. The storage of information during the retention stage may contribute to the inability to recall accurately.

Forgetting as investigated by Ebbinghaus (in Loftus, Greene and Doyle, 1989) suggests that one may forget a great deal of information soon after it is learnt and that thereafter forgetting becomes more gradual. Most forgetting curves show a decline in recall with the passage of time, however not all forgetting curves have the same shape. Bahrich (in Loftus, Greene and Doyle, 1989) investigated the decline in recall by looking at memory for faces over an academic term. Within this research professors who had taught forty students either two weeks, one year, four years or eight years previously were asked to identify them. This research revealed that there was a general decline in the accuracy of recall increasing with time. It is hypothesised that one of the reasons why we fail to recall is that the information

was never stored in the first place. As events may interfere with each other.

Interference suggests that the passage of time alone is not responsible for the loss of memory. After witnessing an important event, witnesses are often exposed to new information. Research has indicated that past experiences can effect the memory of the original event. This raises the question of the malleability of memory. The interval of time, between viewing an event, encountering a subsequent misleading message and engaging in a final act of recollection can effect the memory change. Acceptance of the misleading information is enhanced by the fading of the original memory with the passage of time (Loftus, in Raskin, 1989).

Furthermore the syntax of a post event message influences the likelihood of its acceptance, therefore **misinformation** is casually or unintentionally assimilated into memory.

It has been suggested that during the retention stage the passage of time may increase the possibility of forgetting, in addition to the failure to store information correctly as a result of interference may be another explanation for the failure to recall.

2.2.2.3 THE RETRIEVAL STAGE

Evidence suggests that eyewitnesses reports can be biased or distorted at the retrieval stage, therefore how the information is elicited from the witness is crucial. It is the objective of the interviewer to assist the witness to accurately reconstruct past events. It is therefore necessary for the interviewer to be aware of which technique at the retrieval stage will illicit the most accurate information.

The method of questioning and the question order are two areas which have been explored to understand the retrieval of witnessed events from memory. A number of different questioning techniques may be utilized. These may include: open-ended questions; specific questions with a yes\no response; or free recall responses. The latter may produce the most accurate but the least complete information in the initial recall (Lipton, 1977). Regarding question wording, small changes in the wording can result in dramatically different answers. Leading questions decrease the accuracy of the witnesses recall only when the interviewer is assumed to be knowledgeable about the event. Witnesses to a large extent are protected from leading questions within the courtroom, however they are not protected from them within the police station or any other venue prior to the trial. The task of eliciting information from a witness can be thought of as helping the witness to "accurately reconstruct past events" (Raskin, 1989, p.35). It is therefore necessary for an interviewer to be aware of the ways in which witnesses recollection is likely to be affected by different methods of questioning and more specifically which technique elicits the most accurate information. Research consistently shows that if witnesses are allowed to report freely rather than being asked specific questions they produce the most accurate information. However these reports constitute the least complete information as omissions are high, especially with children (Lipton, 1977).

Yarmey (1979) suggests that optimal results will be achieved if the witness is firstly allowed to report freely and then asked specific questions. It is still necessary however to take note of, and pay close attention to, the wording of the questions.

Past studies show how small changes in question wording can result in very different answers, the answers we receive depend on the questions we ask. Loftus and Zanni (in Loftus, Greene

and Doyle, 1989) found that the question "Did you see the broken headlight?" led to more 'Yes' answers than, "Did you see a broken headlight?". This illustrates how subtle differences can have major effects. Smith and Ellsworth (1987) have shown that leading questions decrease witness accuracy only when the questioner is assumed to be knowledgeable about the crime. These studies serve to illustrate that the wording of questions can influence the answers.

In conclusion research has indicated that during the retrieval stage the method of questioning used may determine the accuracy of recall. Interviewers therefore need to be aware of which methods would contribute to improving the retrieval of information.

2.2.2.3.1 IMPROVING RETRIEVAL

After an event has been witnessed it is necessary, through retrieval strategies, to elicit an accurate account of the event. Davies, Ellis and Shepherd (in Loftus, Greene and Doyle, 1989) investigated context reinstatement, and found that mental guidance and physical reinstatement of an event can produce small improvements in the quality of recall. Similarly Bekerian and Bowers (in Loftus, Greene and Doyle, 1989) showed that ordering the test questions to recreate the temporal order of an event can lead to better memory for the event. Research by Krafka and Penrod (1985) suggests that providing some details about an event can lead to better memory for other details. In this case the questions act as a trigger for other information. This research was conducted with adults, no direct evidence for children could be found.

Research by Ornstein (in Azar 1995) indicates that "stress can enhance a child's memory of

an event" (p.20). This notion is supported by Stein in the same article in that "memories that are emotionally important to the child are stored accurately even in very young children" (1995, p.20). Ornstein concludes that what can be remembered later is largely determined by how children understand and represent events in memory.

Two further techniques useful to improve retrieval are the Cognitive Interview and Mental Guidance Techniques. These will be elaborated on in the next section. Within the retrieval process the witness is required to recall details pertaining to the event witnessed while on other occasions, it may be necessary to recognize and identify the perpetrator.

When a child is asked to give evidence in court the child is ostensibly asked to give a verbal reconstruction of something that he\she has experienced in the past. This means that giving evidence is a memory test of both recall regarding the event and recognition in cases when person identification is required.

2.2.2.3.1.1 RECALL

When a child witness is asked to recall details there are two possible errors that could be made, those of omission and those of addition. The latter according to Fouché and Hammond (1987) is more serious and may be as a result of leading questions.

Several studies have shown that children have more difficulty than adults in narrating their observations and are more likely to make errors of omission (Kobasigawa, 1974). Fouché and Hammond (1987) cite research by Brown (1979) and Chi (1983) who demonstrate that children do make more omission errors in recall of an event than do adults. The reason for

this, according to Johnson and Foley (1984), is due to children's lack of relevant prior knowledge that helps them to arrange elements into a connected whole or relate one set of circumstance to another. However if they are given external prompts or cues, they perform well on recall. Brown (in Fouché and Hammond, 1987) suggests that between the ages of five and nineteen children develop techniques or strategies for structuring the information which results in better recall of the event.

Research has indicated that young children who are required to use free recall are often disorganized and their ability to recount their memories is impaired. It is further suggested that the amount a child recalls can be increased provided the interview provides a clear and logical structure for their memories (Emmerich and Ackerman,1978; Kobasigawa, 1974).

2.2.2.3.1.2 RECOGNITION

Recognition memory is often required in situations where children are asked to identify a perpetrator either by means of a live identification or with the help of photographs. Research suggest that age determines the accuracy of performance. Parker, Haverfiled and Baker-Thomas (1986) found that there were no differences in the performance of 8 to 24 year old's. However younger children, as demonstrated by Goodman and Reed (1986), show that children of three years and younger find it more difficult than older children to identify perpetrators by using photographs.

Chance and Goldstein (1984) investigated facial recognition. They suggest that children may have even more difficulty than adults as eye witnesses. They found that the accuracy of correct identification of strangers increased with age.

Neiser (in Johnson and Foley, 1984) set out to establish whether children and adults used selective looking. Six year old's, nine year old's and adults were asked to watch a Ball game on Television. They were to press a button whenever a critical event occurred. During the game a woman with an umbrella walked across the playing field and was on the screen for four seconds. Later the subjects were questioned about the lady with the umbrella. It was found that the adults had not noticed her, but 22% of the 9 year old's and 75% of the six year old's remembered seeing her. This suggests that younger children notice irrelevant events more than adults. This could have a bearing on courtroom proceedings. In contradiction to this finding, recall for peripheral events, according to Dent and Stephenson (1979) indicates that children are weaker than adults. However Fouché and Hammond (1987) quote research by Neisser in which the importance is demonstrated to note that children may be less "efficient" than adults in deciding what is central and what is peripheral in an incident, resulting in children actually attending to more details than do adults.

As this study views memory retrieval for events within a developmental framework the effect of age on recall will be elaborated upon. Literature reviewed will be drawn from research in the psycho-forensic area.

2.2.3 CHILDREN AND ADULT MEMORIES

The age of the witness has been the focus of numerous research studies. In the past it was suggested that children are inferior to adults in giving testimony involving recall of events (Rouke and Varendonck, 1957). More recently this view has been challenged. Recent research has indicated that children are not necessarily inferior witnesses but may have difficulties in the retrieval of information. This highlights the necessity to focus on ways to improve retrieval techniques.

The area of age difference in the reliability of memory has been the focus of much research. Results have shown that children's memories can be very powerful and that age differences in memory performance can be reversed. For example, if children possess superior knowledge of subject matter it will serve to increase their recall (Chi 1978 and Lindberg 1980, in Haugaard, 1988). The ability to remember information is determined by memory capacity, prior knowledge, mnemonic techniques, contextual cues, motivation and the emotional state of the eye witness.

Whilst comparing children and adults performance on memory tasks, an inability to remember material in long term memory is attributed more to failure to retrieve stored information than to total loss from memory (Tulving, 1969). Adults have superior long term memory compared to that of children due to the fact that they have greater efficiency in organizing information by either Semantic clustering or grouping of information to be remembered into sub-categories. Recall of items often occurs in clusters or in strings of information with one item cueing the recall for another item. Studies of clustering in children have revealed a developmental trend. Grouping does not facilitate recall for children seven years and younger

(Harris and Burke 1972; Mccarver 1972, in Yarmey, 1979). Younger children have information in long term memory and they do not spontaneously use organizing activities to facilitate recall (Naus and Ornstein, 1977). This notion has a direct bearing on and implications within the legal arena. Questioning children about their memory of events will be facilitated if the questions are arranged and are presented in a structured way. Questions should be organized in themes, time sequences and locations.

Parker, Haverfield and Baker-Thomas (1986) looked at the effects of age of a witness and the age of the suspect as influencing the eye witness. After viewing a slide sequence of a mock crime the children and college students were asked to identify the suspect and asked descriptions and peripheral objective questions, relating to the mock crime. They found that descriptive questions were answered better than peripheral questions by adults as compared to the children. There was no difference between question types for children. Children and adults were equally accurate with photo identification.

Retrieval of information stored in memory has also come under the spotlight of research with infants. The question arises: Does an older infant remember more or is he\she more skilled at retrieving information? Rovee-Collier and Fagen (1981) suggest that if we agree that memories neither decay nor are lost but are permanent, then it follows that forgetting is a retrieval failure rather than a deficiency of memory.

Sullivan (in Rovee-Collier and Fagen, 1981) has found that three month old infants did not retain a conditioned response after an interval of two weeks, however, by reactivation using contextual cues the conditioned response was recalled. This further supports the notion that

memory retrieval is more important than that of recall. Laboratory tests with reference to memory tasks involving recall for the occurrence or order of pictures, have revealed that young children remember less than adults, that the accuracy with which they remember is often as high as that of adults (Johnson and Foley, 1984). Young children therefore make more errors of omission than adults, in particular free-recall tasks, however it is important to note that as they get older the number of omissions decrease.

Research done by Goodman, Rudy, Bottoms and Aman (1990) suggest that children like adults, may be more accurate in reporting the central actions of an event which are personally meaningful to them as opposed to reporting peripheral details.

The amount of the child's recall can be significantly increased especially if the questioner provides a clear and logical structure for their memories (Emmerich and Ackerman, 1978) this will be highlighted in the section pertaining to questions. Numerous studies have been undertaken to illustrate that the accuracy of children's memories is a function not only of the child's, but also of the circumstances of the event to be remembered, the type of memory test, the type of information requested, and the setting of the interview.

The question of reliability of children as eye witnesses represents the corner stone in the research previously identified. The following sections deals with the issues pertinent to reliability.

2.3 RELIABILITY

Statements such as the following appear repeatedly in the literature, "... a child's power of observation and memory are less reliable than an adult's," (Heydon as quoted in Spencer and Flin, 1990, p.238). Fouché and Hammond (1987) suggest that there is a frequent demand for corroboration of a child's evidence, suggesting that their testimony alone is unreliable.

The reliability of children's testimony is questioned from a number of different perspectives. Yarmey and Jones (1983) demonstrated that the perception regarding the reliability of child witnesses testimony is not necessarily only restricted to that of the legal profession. Their research asked groups of psychologists, lay people, legal professionals, law students and college students to judge how reliably they thought an eight year old child would respond to questions in a courtroom and from police. The findings from this research indicated that 82% of the psychologists believed that children were more likely to reply in a way that would comply with what the child thought the questioner wanted. 49% of the legal professionals felt that the child would go along with the person asking the questions. 53% and 37% of the law and college students respectively thought that the child would go along with the examiner. It is interesting to note that the legal profession and the college students had the highest percentage of confidence that the child would reply accurately while only 6% of the psychologists shared this view. The level of confidence by psychologists may be a contributing factor to the notion of children being unreliable witnesses.

Fouché and Hammond (1987) suggest the reason for the low perceived reliability of the child witness is a result of the general belief that children have poorer memories than adults; that they are more prone to suggestibility; and that they are unable to distinguish fantasy from

reality. In addition court procedure often plays on this perception: "Defense attorneys frequently undermine the credibility of child witnesses by focusing the jury's attention on inconsistencies in the child's testimony," (Myers, 1993, p.577).

The concept of children as witnesses is complex. Children may often report more limited information than adults but what they report is not less accurate. Two important variables are at play: the age of the child and the questioning technique used to evaluate the child's ability to remember. Both these variables contribute to the accuracy and reliability of the child witness. It is within the questioning technique that the issue of suggestibility is raised.

2.4 FACTORS INFLUENCING RECALL

The child's ability to recall an event which was witnessed may be interfered with by a number of factors according to current research. **Suggestibility** has been widely researched to ascertain to what extent it effects the accuracy of recall. Furthermore children's perception of **fact and fantasy** are often used to discredit child witnesses. Linked to this is the notion of **egocentricity** as it relates to the child's ability to perceive anothers point of view. **Gender** has been researched and findings are inconclusive. However, it is an area which has received attention and requires more research to identify to what extent it is an important factor in recall.

2.4.1 SUGGESTIBILITY AND VULNERABILITY

Suggestibility has been the focus of numerous research studies with the emphasis being on the notion that children are more susceptible to suggestion than adults.

Brown (in Loftus, Greene and Doyle, 1989) said "create if you will an idea of what the child

is to hear or see, and the child is likely to hear or see what you desire " (1926, p.19). Current research highlights the complexity of this issue which needs to be addressed within a developmental perspective.

It is commonly felt that children are suggestible witnesses, as their testimony can easily be distorted by leading questions or by misinformation. Two important questions emerge:

* Are children's reports of witnessed events likely to be influenced or distorted by leading questions or by misinformation?
* Are child witnesses more or less suggestible than adult witnesses?

Davies, Flin and Baxter (1986) caution that it is necessary when considering suggestibility to be aware of the different influences which affect the child witness. Two major influences are highlighted. Firstly, **social conformity**. This may have more of an effect on children than adults, due to the fact that adults have a natural form of authority over them. It is suggested by the researchers that this type of suggestibility can very easily be minimized by means of careful interviewing with particular emphasis on the questioning techniques in addition to the establishment of good rapport prior to the questioning. Secondly, **cognitive malleability**. Here the capacity for assimilation of "suggested" material into the encoded memory about an incident, resulting in a failure to differentiate between the real and the suggested material, is the central research question. Fouché and Hammond (1987) suggest that children are less susceptible to suggestion than adults due to the fact that children have less well formed semantic memories. New information is therefore more likely to be integrated into the semantic memory of an adult than that of a child. This position suggests that children's

memories consist of discrete, episodic elements which as a result are less likely to be fused and confused by suggestion. This conclusion is challenged by other researchers.

According to Lepore and Sesco (1994) child witnesses provide only brief and vague details, depending on the developmental stage of the child. They suggest that it is necessary for the interviewer to ask questions so as to obtain information which is both pertinent and relevant to the case. They suggest that it is also necessary for interviewers to press for more information and lead the child witness to providing a fuller picture with more information which is relevant to the investigation. The need obviously exists to ask questions to obtain a more comprehensive account of the crime, and as a result a central concern is whether the child witness can maintain an independent memory for the event and at the same time be asked questions which do not influence the child or change his\her memory for the event.

As a result of such claims children are seen as highly suggestible, unable to differentiate fantasy from reality and have malleable memories, however according to Goodman (1984), adults suffer from the same limitations.

Goodman and Michelli (1981, p. 83) suggest that children can be excellent witnesses provided that:

1. Conditions in the courtroom are supportive and similar to those in the laboratory.
2. If parents do not impose their own view on their children's statements.
3. If lawyers do not ask leading questions.

Conflicting research findings have led to debate centred around the age at which a child is more or less susceptible to suggestion. Early research into suggestibility of children suffered from methodological flaws and from the intrusion of negative bias against children (Goodman, 1984). Ceci, Toglia and Ross's (1987) studies found that very young children were more suggestible than older children or adults. In their study, Ceci and colleagues presented an illustrated story to children aged three, five, seven and ten years of age. One day after they heard the story each child was tested using biased or unbiased information. Two days later the children were to select a picture that accompanied the original story. It was found that the younger children were more likely than the two older groups to select the suggested picture. It is postulated from this study that suggestibility may be relevant to children under the age of five, but appears to be less pertinent to older children. Research also indicates that children are less suggestible when information relates to peripheral information as opposed to central details (Goodman and Reed, 1986).

Dent (1982) found that children are more influenced by leading questions when, **Firstly**, asked about descriptions of people and things as opposed to events. **Secondly**, when pressed to supply additional details. **Thirdly**, when they do not have a good memory of the information in question. **Fourthly**, after long delays. **Fifthly**, when the interview is stressful and **Lastly** when the interviewer lacks the appropriate skills for dealing with children. This serves to highlight the importance of the skill of the interviewer in being vigilant not to push for information not stored and to be sensitive to the child witness's needs.

Gail Goodman (1984) argues that the issue is not whether children are suggestible but whether children are easily led when questioned about personally significant events (for example, Child

abuse). Goodman (1984) has demonstrated that children as young as four years old are remarkably resistant to suggestive questioning regarding potentially abusive actions, which is in contrast to Ceci's (in Goodman, 1984) research findings. It is important to note that the latter research did not involve an emotionally laden issue. Goodman (1984) concludes that even after delays of a year children are extremely unlikely to make false reports about abuse in response to leading questions and further suggests that children make more errors in omission than commission.

The danger of leading questions is that the child has greater difficulty organizing his\her memory which will result in the child being more susceptible to the information contained in leading questions. Loftus and Davies (1984) suggest that children have greater difficulty in retrieving information from long-term memory which makes them more prone to rely on new information to fill in the blanks. Dale, Loftus and Rathbun (1978) found that by asking leading questions the possibility that the subjects would incorporate new information into answers given two weeks later increases. In a recent study which looked at leading questions, researchers tested a specific intervention which was designed to improve children's awareness that interviewers might transform children's guesses into questions and ask for confirmation thereof. It was evident that children who received this intervention prior to being interviewed showed significantly more resistance to misleading questions than that of the control group (Saywitz and Snyder, 1993). It is important to note that the children who received the intervention furthermore responded to non-leading questions in the same manner which reduced their number of correct responses.

Dent (1982) suggest that to minimize suggestibility the following points should be kept in

mind:

1. The Interviewer explicitly tells the child that he\she does not know what occurred.
2. Giving the child unambiguous and comprehensive instructions at the start of the interview.
3. Explicitly instructing the child to say 'I don't' know if they are not sure.
4. Generally avoiding leading questions.
5. Interviewing the child on the home ground if possible.

The above suggestions by Dent would serves to counteract the effects of social conformity to an authority figure by giving the child permission to disagree with the interviewer or adult who clearly states that they do not know the answers to the questions.

The question of malleability of children's memory is raised as it relates to the use of leading questions Bower (1985) illustrates the controversy within this field by citing done by Loftus and McCloskey. Research by McCloskey suggests that memories change little over time. However research by Loftus, revealed that misleading information can replace the original memory, which in her opinion, is permanently lost. Other researcher's are of the opinion that the original information is not lost but is rather made inaccessible, as a result of misleading information that has been fed to the person. Another view is that if subjects forget the original information before being fed the misleading information they will rely on the latter when being assessed. Mcloskey, concludes that misleading information has no effect on a persons ability to remember the original event, but rather that some of the effects of misinformation are due to the altering of a response rather than the memory as such. This idea is challenged by Loftus, who holds fast that memories can still be slightly altered by post-event information.

As a result of the child's difficulty with the retrieval of information spontaneously from memory, there is the possibility that suggestions that are put to the child may well influence the content of a statement they make about an incident, due to the fact that the suggestion represents a newer piece of information for the child (Loftus and Davies, 1984) and is therefore more easily accessible at the retrieval stage.

An interesting area of research, which until recently has been overlooked, within the area of suggestibility, is how leading or suggestive questions influence not only children's factual recall but more importantly how children interpret events as a result of leading and suggestion. Research was carried out by Lepore and Sesco (1994) which revealed that young children are prone to pick up both misinformation as well as misinterpretation about an event witnessed by them when they have been misled by an adult interviewer. They conclude that more research is needed in this regard with particular emphasis on social and motivational factors that might moderate children's susceptibility to suggestion. Thus the problem with leading questions is that they may contain misinformation which in turn may lead to misinterpretations which the child may incorporate into their recall or subsequent reports.

Goodman (1984) investigated how the wording of the question effects suggestibility. She found that errors in response to questions like, "He didn't have brown eyes, did he?' may be as a result of social conformity to an authority figure rather than that of cognitive malleability.

Psychological research shows that children like adults can be suggestible but that this risk can be minimized by the use of sensitive questioning techniques in the hands of a skilled interviewer. Goodman and Michelli (1981) state that studies show that children recall events accurately enough to testify if they are not confused by adults.

Fouché and Hammond (1987) suggest that the use of video recordings are useful and advantageous as it eliminates the necessity for the child to be asked to repeat the testimony time and time again. Therefore the trauma is not re-experienced and there is less possibility that leading questions become entrenched with misinformation due to repeated testimonies.

In conclusion suggestibility is an issue constantly being raised with regards to the credibility of child witnesses. A review of the current literature indicates that many questions surrounding this issue still remain unanswered. A further issue constantly being cited as the reason for the lack of credibility of child witnesses is based on the idea that children are unable to distinguish fact from fantasy.

2.4.2 FACT AND FANTASY

Within the legal arena children are often considered as being incompetent as witnesses due to the fact that they are unable to distinguish between fact and fantasy. Research has highlighted that the developmental perspective is necessary when addressing this issue. In this section the age at which a child can distinguish fact from fantasy is debated. Finally, the type of responses from children is explored as a possible explanation for the criticisms lodged against child witnesses. This serves to highlight the need for interviewers to be aware and sensitive to the age and stage of the child.

Piaget (1929) suggests that children have difficulty in separating fact from fantasy until the age of eleven or twelve. Piaget further suggests that in an early stage of development, children between the ages of three to five years of age, appear to engage in magical thinking, creating or accepting illogical explanations. Critics suggest that there are times when a young child mistakes a dream for a real event or may seem to become so engrossed in play that the boundaries between make-believe and that of reality dissolve. Heydon (1984) emphasizes this position and suggests that "children are prone to live in a make believe world, so that they magnify incidents that happen to them or invent them completely" (1984, p.257). There is no psychological evidence or research that suggests that children are in the habit of fantasising about the sort of incidents that might result in a court case. Furthermore, the suggestion that children are prone to magnify incidents is not well supported. Victims are rather more likely to under report an incident than to inflate it (Berliner and Barbieri, 1984).

In trying to fully conceptualize the notion of fact and fantasy it is useful to distinguish between externally and internally derived memory. Johnson and Foley (1984) make the distinction between externally and internally derived memories. The former being fact and real experienced events which have more spatial, temporal and sensory information. These memories have more detail in contrast to the internally derived memories which would have more schematic detail and contain information about cognitive operations that produce them. Using this as a premise it is easy to distinguish between externally and internally derived memories. They conclude that children do not have any more difficulty than adults in differentiating fact from fantasy. Young children are less likely to lie about events as they perceive rules as moral absolutes. Fouché and Hammond (1987) support this idea and suggest that when a report from a child witness contains a fair amount of details it is more likely to

be genuine than a report that is sparse in details. Generally, it is felt that by age six, children are capable of making the distinction between fact and fantasy (Goodman, 1984).

Children's responses to questions after witnessing a crime may be an area which makes children's testimony questionable. Saywitz, Nathanson and Snyder (1993) are of the opinion that the response from children to questions may sound more like fantasy than reality, due to the fact that children have a limited vocabulary. They warn that "care must be taken to avoid a fantasy-based interpretation of a child's accurate report of some other past event" (1993, p. 68). It is necessary for the interviewer to probe when the child appears to be referring to those items (for example, monsters) which in the adult world are regarded as fantasy, so as to ascertain the true nature of the use of such terms. This would facilitate a better understanding of the response. Saywitz, Geiselman and Bornstein (1992) suggest that on occasion the interviewer and the child may be talking about two very different events but do not realize it, illustrating the need for clarification.

Some research has been undertaken in this regard by Goodman and Aman (1990); Rudy and Goodman (1991) here it was established that a small number of children (between 1% to 3%) do give fantasy responses when questioned about a past real life event. It is important to note that in these studies the event did not include a sexual or traumatic experience and neither were the children's fantasy responses of this nature. Research by Johnson and Foley (1984) demonstrated that under certain conditions children have more difficulty distinguishing what they have imagined from real memories and in others conditions young children may have no difficulty distinguishing between the two. It is therefore essential to delineate which conditions or events, if any, will facilitate the process.

Saywitz, Nathanson and Snyder (1993) conclude that the child's ability to report and communicate what happened during the event will largely be influenced by the stage of development; the adults ability to ask age appropriate questions and to clarify potential misunderstandings. An adults perspective of the children's isolated beliefs in fantasy figures (for example, Santa Claus) should not be adopted when judging a child's competence to testify.

In conclusion, the question regarding "fact or fantasy" has received "no direct experimental attention" according to Johnson and Foley (1984, p. 38). This notion is further supported by Hammond who postulates that "the popular argument used by defence lawyers, that children live in a make believe world and cannot distinguish reality from fantasy is ripe for empirical investigation" (1987, p.84).

Another area which is frequently used to raise concern regarding child eye witnesses is egocentricity. This according to the legal perspective may be one of the reasons why children are regarded as being unreliable witnesses.

2.4.3 EGOCENTRICITY

It is necessary to consider the notion of egocentricity with regards to child witnesses as this according to some researchers, may be the reason for the child's inability to comprehend anothers perspective as it may not have a direct bearing on them personally. Both moral and cognitive weaknesses are cited as an explanation in this regard.

The concept of egocentricity as it relates to children as eye witnesses can be dealt with by

establishing the two dimensions associated with egocentricity thereof. Firstly, egocentricity as a **moral weakness**, suggests that there is a lack of concern for the impact of ones actions. Very young children's emotional frame of reference is egocentric and their interpretation of cause and effect is primarily self-centred. The ability to make inferences about what others feel develops between the ages of four to five (Garbarino and Stott, 1989).

Secondly, egocentricity as a **cognitive weakness**, where it is suggested that children are unable to appreciate another persons point of view and as a result cannot select memory for information that does not have personal significance. Heydon (1984) is of the opinion that any details witnessed by a child which are not directly related to their own world is quickly forgotten by them. As a result children fail to remember details that do not interest them. King and Yuille (1987) suggest the real danger of egocentricity may not be as a result of the child's perspective but rather the egocentricity of the adult who is unable to appreciate fully the child's perspective in an interview. Bearing the factors influencing children's reports of events in mind the methods of interviewing reported in the literature will be reviewed in section 2.5.

It is necessary at this stage to explore the issue of gender on the accuracy of recall.

2.4.4 GENDER

Research which has been undertaken to identify if gender has a significant role to play in the accuracy of recall, reveals some conflicting results. Some research shows that women perform better than men in memory tasks (Ellis, Shepher, Bruce 1973; Lipton 1977, in Loftus, Greene and Doyle, 1989). In contrast Trankell (1982) demonstrated that women perform worse than men do. Yet further research undertaken by Geiselman, Fisher, Mackinnon and Holland (1986) suggests that there is no difference in men and women with regard to memory. More specifically research focused on type of questions being asked of males and females. Research by Parker, Haverfield and Baker-Thomas (1986) indicated that there were gender differences with regard to eye witnesses who were required to answer descriptive and peripheral questions. Men answered descriptive questions better than peripheral questions, females showed no difference across the types of questions. These findings are consistent with research by Powers, Andriks and Loftus (1979).

Given the discrepancies found in the research it is difficult to ascertain conclusively if gender has a significant role to play in the reliability of eye witnesses. It also illustrates the subtlety of the influences which may be at play. Further research is needed within the developmental perspective.

As previously highlighted the interviewing process of child witnesses have a crucial role to play in the accuracy of recall.

2.5 METHODS OF INTERVIEWING CHILD WITNESSES

The methods of interviewing child witnesses highlights the junction between the psychological and legal paradigms.

"The way children are interviewed by social workers, police officers, physicians, and others is increasingly important in child abuse litigation" (Myers, 1993, p. 576).

Westcott and Davies (1993) are in support of preparatory programmes which help to familiarize the child with the court environment and procedures which will enable the child to give a better account of events. Bannister (in Fouché and Hammond, 1987) makes four suggestions with regard to the prosecutor interviewing the child. **Firstly**, it is suggested that the child and his\her parents visit the public prosecutor prior to the trial so as to establish rapport with him\her, this will help to alleviate the emotional stress that the child witness has to go through. **Secondly**, it is beneficial if the child is given a tour around the court to enable him\her to familiarize themselves with the surroundings. **Thirdly**, during pre-trial the prosecutor should establish if there are any "special words" the child uses which might be beneficial when questioning the child. **Lastly**, a familiar or trusted adult should be allowed to sit in close proximity to the child at the time of the trial so as to alleviate stress.

The nature of the statement and the circumstances under which the child's statement, with particular reference to the questions being asked, prompt one to address the methods of interviewing.

The completeness and the accuracy of the eyewitness's account having witnessed an event according to the report by the Rand Corporation (in Roy, 1991) is the major determinant as to whether or not a case is solved. This highlights the need for careful consideration being paid to the methods of interviewing children and the specific questions being posed.

To facilitate the process of obtaining evidence from child witnesses it is necessary to **Firstly,** ensure that the environment in which the questioning is done is relatively familiar to the child in an attempt to reduce the stress. **Secondly,** the format used for eliciting information from the child will contribute towards the completeness of the information retrieved. Specific techniques such as the cognitive interview are detailed in addition to the use of specific questions. It is in the latter regard that content and the form of the question determine, according to current research, the completeness of the testimony.

Dent (1987) attempted to determine which characteristics of the interviewer correlated positively in obtaining accurate information from the child. From this research is was deemed that the main determinant for obtaining accurate accounts of an event was not professional experience but rather whether the interviewer has a preconceived notion of what had happened. Given these findings Goodman (1984) suggests that the ability of the interviewer to establish rapport with the young child, would be expected to effect the accuracy and completeness of the child's report.

The Cognitive interview has received a great deal of attention. Current research in this regard highlights the usefulness of this technique. This technique will be reviewed and evaluated.

2.5.1 THE COGNITIVE INTERVIEW

Geiselman and Fisher (1989) have focused on the development of interview techniques which would improve the quantity and quality of information which is being obtained from witnesses. They postulate that their cognitive interview is a non-hypnotic memory enhancing technique. Their experiments have indicated that the cognitive interview produces better recall than conventional interview techniques.

Roy (1991) investigated the cognitive interviewing techniques in contrast to the standard police interview in determining which would be a more effective technique. Wells (1978) identified those variables that effect eyewitness accuracy and that the police can or cannot control for. **Firstly**, estimator variables such as the confidence of the witness; stress; race; and conditions such as the number of times that the witness saw the perpetrator. **Secondly,** system variables were furthermore identified as including methods of questioning witnesses and methods of identification. Current practise by police, according to Roy (1991) is one in which free narrative, question and answer or combinations thereof are employed. This equips police as "report takers" and not "information gatherers". The shortcomings of the police interview technique, namely the use of a few open ended questions; the incorrect sequencing of questions; the use of negative phrasing and the use of non-neutral language in addition to inappropriate language, has prompted the introduction of the cognitive interview which is seen as an alternative memory-enhancing technique. The cognitive interview proposed by Geiselman and Fisher (in Geiselman, Fisher, Cohen, Holland and Surtes, 1986) is based upon two fundamental psychological principles of memory. **Firstly**, that the memory trace is composed of several features and the effectiveness of a retrieval cue is related to the amount of feature overlap with the encoded event, which is a statement of encoding specificity.

Secondly, there may be several retrieval paths to the encoded event, so that the information which is not accessible by one retrieval cue may be accessible by means of a different cue. Keeping this theoretical framework in mind Geiselman and Fisher developed the Cognitive interview which is a memory retrieval procedure which consists of four retrieval mnemonics.

Standard interview involves the witnesses giving a narrative report of the crime followed by specific questions. A similar format is followed with the cognitive interview the only difference being that careful instructions in the form of these mnemonics are given prior to eliciting a narrative report.

The four retrieval mnemonics are:

* **Reconstruct the circumstances**
* **Be Complete**
* **Recall in a different order**
* **Change perspective**

The first mnemonic requires that the witness mentally reinstates the environment and the personal context that existed at the time that the crime took place. The second mnemonic seeks to obtain a fuller version of the incident. The first two mnemonics focus on the encoding and the retrieval of information while the second two focus on the different paths of retrieval. The recounting of the events in a different order and the changing of perspective are claimed to enhance recall.

In addition to the above mentioned mnemonics specific techniques are used to elicit further information such as physical appearance, names, numbers, speech characteristics and conversation.

Geiselman and Callot (1990) raise debate as to order of recall, witnesses were required to recall events in reverse, in order that the witnesses examine the memory record without the influences of their general knowledge or the type of crime in question. The assumption adopted is that when events are recalled in the correct forward order people may reconstruct in their memories what they think must have happened. Based on their knowledge of similar crime scenarios. Geiselman and Callot (1990) found that reconstructing the event in the correct sequence lead to incomplete or even inaccurate reporting whereas the reverse order led to more accurate reporting. They suggest that reverse order is less schematic and as a result may lead to recall of actions that are incidental to the crime. This finding is challenged by Morris and Morris (1985) whose research details the necessity for the questions to follow the order in which the event occurred to improve the accuracy of recall. On the other hand the cognitive interview has been found to be effective in several studies. These studies report that the amount of correct information was significantly greater than that observed with Standard Interview Techniques. It is important to note that this research also revealed that the amount of incorrect information did not change and that the same amount of confabulation was evident in both, on the whole the content of reports was improved.

Geiselman and Fisher looked at refining the Cognitive interview. They found that there were characteristic differences between effective and ineffective interviewers. More effective

interviewers asked more open ended questions and allowed the witness to dominate the interview in contrast to, ineffective interviewers who asked more direct short questions and played a major role in the interview. On the basis of this work the Cognitive interview was revised to include four additional principles. Firstly, **event-interview similarity**, here the interviewer tries to reinstate in the witnesses mind the external emotional and cognitive features that were experienced at the time of the crime. The witness is transported mentally to recreating and reconstructing the circumstances. Secondly, **focused retrieval**, here the interviewers task is to assist the witness to focus and concentrate in order to exclude any disruptions to the retrieval process for example, noise. Thirdly, **extensive retrieval** in which the witness is encouraged to conduct as many retrieval attempts as possible. Lastly, witness **compatible questioning**, in which successful retrieval will depend on how compatible the questions are to the form in which the witness learned of the information. Therefore it is necessary to adapt the interview to suit the witness. It is required that the interviewer place him\her self in the witnesses mind and ask questions that are relevant to that perspective.

In conclusion this research indicates that cognitive interviewing reliably enhances the completeness of a witnesses recollection without increasing the amount of incorrect or confabulated information. The cognitive interview has been shown to be effective with a wide variety of diverse populations, such as college and non college students, adults and children. Subsequent research has challenged these findings and has indicated that other techniques may be more effective especially with children. Saywitz, Nathanson and Snyder (1993) report that information is forthcoming from child witnesses when they are asked direct specific questions. They propose that children do not necessarily remember less than adults, but are less proficient when required to produce information without guidance to stimulate their memory.

This highlights the necessity to explore the use of specific questions with particular reference to child witnesses.

2.5.2 QUESTIONS

Whilst questioning child witnesses, insufficient developmental sensitivity, by professionals, according to Saywitz, Nathanson and Snyder (1993), can frustrate children who may be trying to answer questions that they are incapable of understanding. Children may be questioned in language which is too complex for them to understand, about concepts that are too abstract to understand.

As stated earlier there is general agreement that narrative reports tend to be more accurate than reports which are obtained through questioning (Binet, 1900; Stern, 1939; Dent and Stephenson, 1979 in Goodman, 1984). However, there is some debate as to how applicable this is to child witnesses. It is difficult for a child witness, who is under stress and may be anxious as a result of a traumatic experience, to volunteer a full and spontaneous account of the event without some degree of prompting. Nurcombe (1986) found that children under nine years of age have less capacity than older children to recall past events without prompting. These findings suggest that set questions as opposed to free recall are more useful for under nine year old's.

There are generally four types of questions which may serve to increase or decrease the child's memory for the event (Dent 1987). Namely; free recall, general questions, specific questions and leading questions. It may be recalled that although there are developmental differences in recall, younger children can still perform at an acceptable level (three, four and

five years of age) if carefully interviewed and provide valuable information (Goodman, 1984).

It should however be born in mind that there is always the danger that interviewers may use leading questions in an attempt to elicit more detailed information. This is particularly pertinent to cases in which the child is the only witness which is available for the conviction of a perpetrator.

Generally it is agreed that the accuracy of a child's evidence is a function of the skill of the interviewer and as a result in order to get a complete relevant unbiased and accurate account of the event from the child witness, it is essential that the interview be conducted with a well trained sensitive interviewer. Interviewing is defined by Spencer and Flin as a "conversation with a purpose" (1990, p. 277).

In the following discussion research on the order in which questions are asked, as they relate to enhancing the accuracy of recall, will be evaluated.

2.5.2.1 QUESTION ORDER

Morris and Morris (1985) argue that question order influences the accuracy of recall. They hypothesise that an event experienced by a witness would be comprehended and encoded by the witness according to the sequence of events or the memory scripts or schemes (Morris and Morris, 1985). They argue that the reconstruction of the elements of the original experience will be more effective if the cognitive processes initiated by the questions asked matched the structure and order in which the memory was made. They found that ordering the questions in the correct time sequence significantly influenced the accuracy of recall.

This result was further supported by the work of Bekerian and Bowers (in Loftus, Greene and Doyle, 1989). Their study confirmed that ordering the test questions to recreate the temporal order of an event lead to better recall of an event. Roy (1991) also demonstrated that if the sequence of questions was incompatible with the eyewitnesses mental representation of the event, recall was effected.

Ordering of questions has also been shown to influence recall in other ways. Police interviews often may focus on gender, age, height, build, hair colour and dress which would not facilitate maximum retrieval from the eyewitness, as inappropriate sequencing of questions places constraints on the eyewitness ability to revert back to a previous answer or even to change modalities from visual to auditory memory (Roy, 1991). Geiselman, Fisher Cohen, Holland and Surtes (1986) found that in many field interviews the sequence of questions seemed unplanned and generally unrelated to the mental activity of the witness. The haphazard question order frequently created a barrier that obstructed memory.

Whipple (in Yarmey, 1979) was one of the first researchers concerned with the form of the question and how it affected the accuracy of recall. Whipple found that the accuracy of response to the following four question types was poor; Determinative questions, Disjunctive Questions, Expectative Questions and Implicative questions.

Goodman and Reed (1986) investigated the affects of the form of questions with children aged three and six and with adults. All subjects interacted with an unfamiliar adult. Four or five days later they were interviewed. The three year old's were found to be inferior to the other groups in free recall when answering objective and suggestive questions. The six year old's

were comparable to the adult group in answering objective questions, recognizing the target in a photo but recalled less and were more suggestible. This research demonstrates that children's eyewitness accounts are not uniformly less reliable than that of adults but that this effect is influenced by the developmental stage.

Suggestibility can also be manipulated by phrasing the question with more than one negative (Muscio in Yarmey, 1979) or by changing the emotive connotation of single words. Subjects are therefore more likely to make inaccurate judgements when emotionally laden words are used.

To further complicate the picture research has indicated that initial questioning of a witness may influence later recall as subjects reconstruct both the memory for an the event and any interpretations given during initial questioning. Miller and Loftus (in Yarmey, 1979) demonstrated that leading questions may contribute to misidentification of perpetrators and false accusations.

Further research by Parker, Haverfield and Baker-Thomas (1986) showed that children and adults appear to have similar abilities on initial questioning but on further investigation the type of information elicited and the stability of the responses reveal that developmental differences are present. Adults answered descriptive questions more efficiently than peripheral ones. While children demonstrated little difference in answering descriptive and peripheral questions. The implications of this are that adults are more likely to focus their attention on relevant details and may tend to ignore peripheral information while children appear to encode incoming information without discriminating between relevant and peripheral details. This

finding is consistent with Collins, Wellman Keniston and Westby's (1978) research which demonstrated that as a function of age there appears to be an increasing tendency by adults to attend to core information and to ignore non essential information.

While there are developmental differences in accuracy of recall the testimony of children may still be admissible. Melton, Petrila, Poythress and Slobgin, suggest that "given simple, supportive questions, even young children generally have sufficient memory skills to respond to the recall demands of testimony", (1987, p.102). Research in this area has produced some guidelines as to how this may be achieved.

2.5.2.2 FORM OF QUESTIONS

The form that a question takes has been shown to have a significant effect on the child's ability to recall an event. The vocabulary used and the complexity of the questions needs to be considered in relation to the developmental ability of the child witness.

Children may think that they know the meaning of a word but may have a different conceptualization of the word from adult usage.

While a child will acknowledge having an understanding of the term the context may lead to misconceptions. Such misconceptions will damage children's credibility through errors in recall. For example "court" is a place you play basketball on (Saywitz, Nathanson and Snyder, 1993). Flin, Stevenson and Davies (1989)investigated the **vocabulary** usage in questioning which may be unfamiliar or misinterpreted by children under the age of ten. The **linguistic complexity** of questions has also been shown to effect young children's responses (Brennan and Brennan, 1988). Studies have shown that lengthy compound sentences with

embedded clauses and various other complexities may be beyond the comprehension and memory of many children under eight years of age (Reich, 1986). For example, lengthy questions such as, "When you were on vacation the summer of third grade and you visited your maternal grandmother's house, did your uncle take you to his apartment and what happened there?" are likely to result in confusion for the child. It is suggested that questions need to be broken down into a number of short questions requiring short answers which are more congruent with the linguistic abilities of the child witness.

Questions that contain multiple elements for example, "Did he push you down and hit you?" may also require simplification as one answer may refer to the first part of the question but not necessarily to the second part. Dickson (1981) found that children may respond to one part of the question and not realize that their response may be interpreted as being in line with both aspects of the question. Young children, according to Flavell, Speer, Green and August (in Saywitz, Nathanson and Snyder, 1993), do not ask for clarification if they do not understand what is being asking. Word choice as well as grammatical construction are therefore critical factors in eliciting accurate and credible testimony from children.

More information according to Saywitz, Nathanson and Snyder (1993), is forthcoming from child witnesses when they are asked direct specific questions. It is further suggested that children do not necessarily remember less than adults, however they are less proficient when required to produce information without guidance to stimulate their memory which is required to provide the detail and information within the forensic context.

2.5.2.3 CONTENT OF QUESTIONS

The content of questions asked may also affect the accuracy of the child's testimony.

Children may attempt to answer a question for which they lack the necessary skill which, according to Saywitz, Nathanson and Snyder (1993), will result in adults misinterpreting their answers and thus questioning the child's competence. This is particularly true in the measurement of time, number, and physical appearance. For example, children may be asked to report the time and date at which an event occurred, but young children below the age of seven or eight may have trouble conceptualizing clock times and calendar dates. It may be more useful to relate the time of the incident or crime to that of a daily activity, nap times or meal times.

Fouché and Hammond (1987) suggest that to increase the credibility of child witness reports it is still necessary for the report to contain some information about the setting and the time of the incident. However they caution that exact timing should not be expected from very young children. Saywitz, Nathanson and Snyder (1993) further suggests that even slightly older children may also find it difficult to relate what happened before or after an event. In answering time related questions children without the necessary skill may resort to guessing which may unfairly undermine their testimony. Friedman (1992) suggests that by the age of eight children can use the names of the days of the week and seasons accurately and can describe when two events happened together. Under the age of ten however they may have difficulty when required to report what happened in exact chronological order as is often required in legal proceedings (Brown in Saywitz, Nathanson and Snyder, 1993).

In relation to children's ability to relate how many times an event occurred young children up to the age of six may well be able to count but lack the corresponding understanding of number concepts (Saywitz, Nathanson and Snyder, 1993).

Children are also on occasions asked to estimate a perpetrators, age, height and weight. Saywitz, Nathanson and Snyder (1993), suggest that children do not have the necessary experience or world knowledge to enable them to know which aspects of appearance are permanent and which are readily changed. This may hinder their ability to describe or recognize strangers. Difficulties may also arise when judging height and age as children may think that the tallest person is the oldest. It is therefore necessary that the interviewer probe to ascertain the exact meaning of the child's response. Likewise terminology regarding kinship terms (for example, your grandmother's sisters house) may be very confusing and misleading for children. According to Saywitz, Nathanson and Snyder (1993) enquiries about kinship with children younger than ten years, must be very carefully monitored so as to prevent confusion.

The egocentricity of younger children (previously highlighted) may effect the child's account of events. Children under the age of seven years cannot fully view a situation from anothers perspective (Selman and Byrne, 1974). As children become older they develop the ability to infer what others intend, think, feel and perceive (Shantz, 1975). Questions requiring the child to view a situation from anothers perspective may result in unreliable responses.

Further studies have shown that repeated interviewing of children should be avoided at all costs. Many children may change their responses because they become confused and interpret the repeated questioning as threatening behaviour (van Dokkum, 1995), it may also lead to further psychological damage.

In conclusion children may not be aware of their own limitations and may resort to using a "trial and error" means of finding an answer to the question. Their limited cognitive capacities may result in their credibility as witnesses being challenged. Questions requiring more complex and abstract thought processes should therefore be minimized. Generally studies have suggested that even young children posses the memory skills which are needed to testify provided that they are asked simple and direct questions in a neutral and supportive environment (Goodman, Bottoms, Schwartz-Kenny and Rudy 1991, Melton 1981 in Saywitz, Nathanson and Snyder 1993).

The methods of interviewing children discussed have highlighted the necessity to focus on various retrieval methods so as to enhance recall and recognition by child witnesses to increase the accuracy of their testimony. Of prime concern is the need for careful attention to the interviewing process in addition to the interviewer so as to afford the child witness the opportunity to give an accurate account of events witnessed.

2.6 CONCLUSION

As the literature covering the area of the child as witnesses is diverse and extensive attempts have been made to address that literature pertinent to the study at hand. In order to achieve this the areas of Competence and Credibility were reviewed. It was concluded that an

understanding of the encoding and retrieval processes of memory were vital to the understanding of how children testify or report on events. Factors influencing these processes were highlighted and described within a developmental framework. Research pertaining to the Reliability of children's testimony was reviewed and it was concluded that the interviewing process was of vital importance. Recent research on children's memory, suggestibility and related capacities is very relevant to proper interview techniques. A great deal remains, according to Goodman and Tobey (1994) to be done, and a need exists for research which is specifically focused on forensically defensible interviewing. Methods of interviewing children and the arising issues were reviewed and suggestions made as to how the reliability of children's testimony may be enhanced by the interviewing process. Fouché and Hammond hold fast that "there is a serious need for better guidelines for conducting interviews with children" (1987, p.72)

CHAPTER 3

RESEARCH DESIGN AND PROCEDURE

3.1 AIMS OF THE STUDY

As outlined in chapter two, section 2.5.2.1, of the literature review, the interviewing technique and the type of questioning used may determine the accuracy of recall when reporting on an incident. The form and order of the questions may play a major role in determining the reliability of the testimony given by the child. As has been established by Morris and Morris (1985) small changes in the questions asked of adults can produce dramatically different answers. They therefore suggest that it is as important for the interviewer to ask the correct questions as it is for the witness to respond accurately. Their research has furthermore indicated that the details of a witnessed event are stored, comprehended and encoded in a particular sequence according to the order in which they occurred during the event. Thus the script or schema follows the sequence of events. They therefore proposed that if the cognitive process initiated by the question matches the structure and order in which the memory was made, this will facilitate the recall of that event and ultimately effect the accuracy of recall. This research further seeks to investigate whether the inappropriate sequencing of questions incompatible with the sequence of the events will affect the accuracy of recall.

This research focuses primarily on the effects that question order has on accuracy of recall. The procedures adopted by Morris and Morris (1985) in their work with adults were used, with deviations, to explore how their findings relate to children. The age group of interest is children aged six and seven. Based on the assumption that children, like adults will store,

comprehend and encode the details of an event in the sequence of events it is hypothesised that if questions, are consistent with the sequence in which an event is witnessed by children they will facilitate the process of recall. This research seeks to highlight the need for careful attention to be paid to the interviewing process as a means of improving the accuracy of recall with child witnesses. The aim of this research was thus to establish under controlled conditions, how the question order would affect the recall of an event witnessed by children.

3.1.1 DEVIATIONS FROM THE MORRIS AND MORRIS STUDY

The Morris and Morris (1985) study investigated if the order in which questions were asked effected the accuracy and amount recalled. In their study two groups of forty eight subjects (aged eighteen to forty four years) were shown one of two short video films. Prior to viewing the video the subjects were warned that they would be questioned about the video. After viewing the video all the subjects were asked to write a free narrative of the video. Thereafter each group was divided into four equal subgroups, each of which answered questions (thirty questions in total) about the video. The four question orders were as follows:

* **random**
* **correct time sequence**
* **central characters**
* **main event**

The subjects were questioned individually or in small groups either in their own home or in the experimenters home. Their research demonstrated that the ordering of the questions significantly influenced the accuracy with which they were answered. Accuracy was twenty percent better if the questions followed the time sequence of the film as opposed to being

randomly ordered.

For the purposes of this study a number of deviations from the Morris and Morris (1985) study are noted.

1. It was decided to use a **real incident** as opposed to a video so as to facilitate the authenticity of the witnessed event. A video was running when the Research Assistant performed what was to be called the incident. A video as opposed to a story being told was chosen so as to standardize the procedure and the rate of delivery. Stop watches were used to synchronize the entry on two occasions of the Research Assistant.
2. Subjects were **interviewed individually** on the same day and not over a period of time or in groups as with children.
3. No **free recall** was utilized prior to the standardized questions being asked as research with children has indicated that children have more difficulty than adults in narrating their observations and make more errors in omission.
4. The subjects in this study were not **forewarned** about the questions to follow.
5. The **order** in which the questions were asked differed slightly from the above mentioned study, as a 'Reverse Order' protocol was introduced to replace the 'central character order' as it was decided that with children the 'main event order' and the 'central character order' were too closely linked to make a clear distinction.

3.1.2 THE HYPOTHESIS

The Research Hypothesis: The order of questions will affect the accuracy of recall.

The Null Hypothesis: Order of questions will not affect the accuracy of recall.

3.2 THE SAMPLE

A sample of sixty two children (boys n= 34 , girls n= 28) were drawn from two class i classes. It was assumed that the group of six\seven year old's came from a similar range of backgrounds as they were drawn from one junior primary school. The school that participated in this research is an English medium urban school in the Pietermaritzburg area. It is therefore assumed that all the children irrespective of their cultural backgrounds were proficient in English. Acceptance at the school is dependent on an entrance test which evaluates proficiency in the English language. Access and entry into the class i is also dependent on a School Readiness assessment. Those children who are found not to be sufficiently proficient are given the opportunity to spend a year in a bridging class which focuses on English language enrichment.

3.2.1 SAMPLE SELECTION

Two criteria were used for the sample selection:

1. **Verbal ability**
2. **Parental consent**

This research was restricted to those children of normal **verbal ability**. The Peabody Picture Vocabulary test was administered to the sample in order to exclude children at the extreme ranges of English Language Acquisition. Only children whose scores fell within the range from two standard deviations below the mean and two standards deviations above the mean were selected. Each child was individually assessed using the Peabody Picture Vocabulary test, two (boys n= 1, girls n=1) children were eliminated from the original sample as their scores fell two standard deviations below the mean and a further eight (boys n= 7, Girls n= 1) children were eliminated as their scores fell two standard deviations above the mean.

Children were excluded from the sample if **parental consent** was not given (see Appendix A). Of the original sample eight parents did not consent for their child's participation (boys n= 6, girls n= 2). The final sample consisted of forty four pupils (boys n= 20, girls n=24), who were then randomly assigned to the four groups using random sample tables. Each group was comprised of eleven pupils.

The mean age of the subjects was six years seven months at the time of data collection.

TABLE 1: SAMPLE NUMBERS

	GROUP 1	GROUP 2	GROUP3	GROUP4	TOTAL
GIRLS	6	6	5	7	24
BOYS	5	5	6	4	20
TOTAL	11	11	11	11	44
MEAN AGE	6,5	7.0	6.9	6.9	6.7

3.3 THE PROCEDURE

The subjects witnessed a contrived incident on a specified day under controlled conditions as research has indicated that live experiments have superior validity in eye witness tests (Pynoos and Nader in Spencer and Flin, 1990).

THE CONTROLLED CONDITIONS WERE AS FOLLOWS:

1. All subjects witnessed the incident on the same day in the same environment whilst watching a video entitled "Daffy Duck".

2. The sequence of events in the incident were controlled by means of following a script.
3. During the viewing of the video a stranger (Research Assistant) interrupted the viewing two minutes after it had started.
4. The Research Assistant went through various actions as detailed in the script. The children observed the events and were later required to recall what had happened.
5. The teacher was not to be present during the experiment and was asked not to discuss or question the children after the event.
6. The interviewing process was controlled by using a standardized instructions and standardised set of questions.
7. The children were interviewed individually, two days after the incident had been viewed, by four trained interviewers.
8. Four different questioning protocols were used in an attempt to establish whether or not question order affected recall.
9. The children were questioned using one of the four question protocols concerning the event which occurred during the viewing of the video.
10. On questioning the children, the interviewers made reference to the video "Daffy Duck" so as to facilitate recall of the incident.
11. The subjects were debriefed by the researcher in a group situation in the presence of the teacher after the interviews were complete.

For the purposes of describing the experiment in more detail, a day by day account of the procedure will be given. **Day One** focuses on the incident which was witnessed by the subjects. A detailed script illustrates the exact procedures that were followed. **Day Two** describes the training of the interviewers, including the selection of the interviewers and the

procedures that they were to follow. **Day Three** focuses on the interviewing of the subjects, the question protocols and finally the debriefing of the subjects.

3.3.1 DAY ONE

3.3.1.1 THE INCIDENT

The children from the two classes were taken into a familiar room in the school which had video facilities. After the children were made comfortable so as to have as few disruptions as possible and were seated the experiment proceeded.

3.3.1.2 THE SCRIPT

Whilst the subjects were viewing the "Daffy Duck" video under the supervision of the Researcher, a Research Assistant knocked on the door precisely two minutes after the video had been running.

The Researcher stopped the video and verbally called out for him to enter the room saying:

"Come in"

He entered the classroom and closed the door behind him.

The Researcher asked him what he wanted saying:

"Can I help You?".

He replied saying:

"Please may I borrow your overhead Projector".

The Researcher confirmed that he could borrow it by saying:

"Yes, you may borrow it, but please be sure to return it to this classroom when you are finished with it".

The Research Assistant agreed to this by saying:

"Yes I will bring it back when I am finished".

He then proceeded to make his way to the front of the classroom and removed the books which were stacked on top of the projector. He then picked up the projector (neglecting to unplug it from the wall). In an attempt to remove it he pulled at it and struggled to remove it without noticing that it was still plugged into the wall.

The Researcher suggested that he unplugs the projector before removing it from the classroom by saying:

"I think that it would be easier to remove it if you unplug it first".

The Research Assistant unplugged the projector and attempted to exit the classroom. Whilst holding the overhead projector he tried to open the door. Due to the fact that his hands were not free he, **Firstly,** tried to use his chin to open the door, **Secondly,** he tried to use his elbow and **Finally** he tried to use his foot, all to no avail.

The Researcher once again came to his rescue and sent one of the children to open the door for him by saying:

"Scott, please can you go and help the gentleman open the door, his hands are full".

The Researcher started the video once the Research Assistant had left the classroom and closed the door behind him. The viewing of the video continued.

The Research Assistant returned four minutes later and knocked on the door. He entered the classroom for the second time and the video was stopped. The Research Assistant said:

"Thank you for allowing me to use your overhead projector".

The Researcher replied by saying:

"You're welcome".

He then proceeded to the back of the classroom where he left the projector on a table. On

entering the classroom for the second time, the Research Assistant wore a large green coat which he had not previously being wearing.

Once he had exited the classroom the subjects resumed watching the video. On completion of the video viewing no mention was made of the interruptions and no discussion of the video took place.

The children returned to their normal class work. The teacher was instructed not to discuss the incident or the video with the class until after the interviews were complete

3.3.2 DAY TWO

3.3.2.1 TRAINING OF INTERVIEWERS

Research has indicated that the quality and the reliability of the child's evidence is a function of the skill of the interviewer. Careful attention was therefore paid to the training of the interviewers. Four interviewers were used who had no knowledge of the incident and had never met the children. The interviewers were selected from a third year psychology class. It was hoped that they would have some sensitivity to the subjects developmental level and the process of interviewing children. Four female students were selected as it was felt that females were more familiar figures in the junior primary school environment. Interviewers with a friendly disposition and who had prior experience with children were selected. Each interviewer was briefed and allocated a number of children randomly from each of the four groups. In order to randomize individual interviewing styles each interviewer interviewed between three and four children from each group and eleven children in total.

The Researcher conducted the interviewer training session in which all interviewers were made aware that being interviewed by a stranger can cause stress and anxiety for some children. Interviewers therefore needed to be sensitive to the needs of the child but at the same time to be clear in asking the questions. They were therefore to be supportive. It was necessary for them to adhere to the standardized set of questions. Any deviations from this were to be noted.

The interviewers were asked to keep their speech as natural and neutral as possible. Interviewers were instructed that the following procedure for interviews was to be followed:

1. The interviewer was informed that the children had viewed a video about "Daffy Duck" on a given day. No further details were given.
2. The children were to be interviewed individually to see how much detail they could recall about the incident.
3. The interviewer was informed that they would be given a list from the Researcher with the names of the children to be interviewed by her and was required to go to the class and fetch each child one at a time.
4. On meeting the child, the interviewer was instructed to introduce herself, using her christian name.
5. Using the prescribed standard instructions she was to explain to the child that she wanted to ask them a few questions.
6. The child would then go with the interviewer to the designated interview room. Each questionnaire would have the child's name clearly printed on it to ensure that the child was questioned, according to the correct questionnaire protocol of the group to which he\she had been assigned.

8. Each of the ten questions were to be repeated twice before the child was asked to give his\her response.

The children were to be told that they must try to remember the incident and try to answer the questions. If they could not remember they would be asked to say so. The interviewers were briefed to be friendly and to make the child feel relaxed. They were to be constantly aware of any signs of distress or discomfort. The interviewers were instructed not to prompt the child in any way and to note down the child's response verbatim. The interviewers were furthermore instructed to maintain eye contact and to give encouraging smiles at the appropriate times. No reference was to be made as to whether or not a question was answered correctly or not. On completing this task the interviewer was to thank the child for being co-operative and ask the child not to discuss the questions with his\her class mates until everyone had a turn to be interviewed. The interviewer was then to accompany the child back to his\her classroom and then to take the next candidate on her list.

Having trained the interviewers they were ready to proceed to the next phase of the research. In the following section the interviewing of the children will be elaborated upon.

3.3.3 DAY THREE

3.3.3.1 INTERVIEWING OF SUBJECTS

The subjects were interviewed two days after they had witnessed the incident.

Once the subjects were fetched from their classroom the purpose of the interview was briefly explained to them. They were set at ease regarding their performance. It was made clear to

them that it was not a test and that they should just try to do the best they could. Bearing in mind that it is commonly believed by children that the interviewer has a previous knowledge of the incident the children were discouraged from guessing. If they did not know the answers they could verbalize this to the interviewer.

The following standardized instructions were read to each child, they were as follows:

Hello, my name is .....

We are going to play a game today. Do you remember the day we saw the video about Daffy Duck. I am going to ask you some questions about that day, they will not be about the video. I want to see if you know the answers. Try not to guess, you can tell me if you don't know the answers. Just try your very best. I will read each question twice and then you can tell me the answer. Think carefully before you reply. Are you ready?

3.3.3.2 THE QUESTIONNAIRE

3.3.3.2.1 THE QUESTION CRITERIA

The questionnaire protocols consisted of ten questions. Short answers were required. There were no leading or Yes\No questions in the questionnaire. The questions were specifically designed for the age group (6\7 year old's) who were being tested. The wording and terminology used in the questionnaire protocols were familiar to them and at an age appropriated level. Each child was asked the same questions but the order of the questions were varied depending on the protocol being used.

3.3.3.2.2 THE QUESTIONNAIRE PROTOCOLS

Following on from the research of Morris and Morris (1985) the first group of children assigned to group one were questioned using the correct time sequence protocol. Those assigned to group two questioned using the questions in a random order. Group three were tested using questions which focused initially on the main event. Group four were questioned with the questions in the reverse order with regard to the time sequence of the actual events. In summary the four protocols were as follows:

GROUP 1:	**Questions in the correct time sequence.**
GROUP 2:	**Questions asked randomly**
GROUP 3:	**Questions focusing initially on the main event.**
GROUP 4:	**Questions asked in the reverse order of the time sequence.**

The four interviewers had an equal opportunity to use the four different questionnaire protocols.

The Four Questionnaire protocols can be found in Appendices B,C,D, and E.

An effort was made to keep the language used in the questions simple. Questions were not complex and did not require abstract reasoning. It is important to note that careful attention was paid to the choice of words and terminology in the questioning of the children. Age appropriate word choices were used. Yes\no questions were avoided so as to discourage guessing. None of the questions required more than one detail as more than this could lead

to inaccuracies as mentioned in the literature review. Short simple answers were required.

All of the children were tested on the same day with the four interviewers working simultaneously in different venues. The venues chosen were located within the school premises and were familiar environments to the children thus reducing the level of anxiety which may be associated with unfamiliar surroundings. The questionnaires were scored to ascertain how many correct details were given by the subjects.

3.3.4 DEBRIEFING

When the interviews were complete the Researcher went to each class and discussed the research project with the children in a group situation. The teacher was present at this stage. The purpose of the debriefing was twofold: **Firstly**, it was to enlighten the children as to the motives of the research. Naturally their developmental and cognitive ability was born in mind when translating the reason for the research to them. **Secondly**, it was a time for the class to ask questions about the research or to discuss any problems or anxieties they had about being interviewed by the Research Assistants. It was during this time that the children had an opportunity to voice their feeling about participating in the research. At this point the children were told that they could discuss any aspect of the experiment with their teacher, friends or parents.

3.3.5 SCORING OF QUESTIONNAIRES

The questionnaires were scored according to the number of correct answers obtained from the subjects. One point was allocated to each correct answer thus giving each subject a total score out of ten, (these scores can be found in tables 2,3,4, and 5).

CHAPTER 4

ANALYSIS OF RESULTS

4.1 INTRODUCTION

The results were analyzed using a number of different procedures. Two statistical procedures were used, Firstly, a **parametric test** (a one way analysis of variance, ANOVA) and Secondly, a **non parametric test** (Kruskal-Wallis Test) was used.The non parametric measure was introduced as it was suspected that the basic assumptions of the ANOVA may not have been met. It was also decided to **qualitatively** assess the responses obtained from the subjects so as to obtain some valuable information regarding the type of errors made. The nature of responses given and the occurrence of no responses to certain questions may prove to further enlighten us regarding the interviewing of child witnesses. The qualitative analysis of the data will be discussed in the next chapter.

4.2 STATISTICAL PROCEDURE

The aim of this study was to investigate if the order and type of questions would effect the accuracy of recall. It was also an attempt to determine whether or not accuracy of recall would be enhanced by a questioning procedure that followed the sequence of the event. By matching the question order to the script or schema of a memory for an event it was hypothesised that this would result in better recall of the event.

The results were analyzed using the two statistical tests described above. A one-way analysis of variance was undertaken as well as the Kruskal-Wallis non parametric test as the requisite assumption of the ANOVA is that populations from which the samples have been drawn are

normally distributed. The ANOVA was employed as tests for equality of means are usually robust with respect to the assumption of normality. The Kruskal-Wallis non parametric test was used as with this test the normality assumption does not have to be satisfied and the sample size does not have to be large enough to warrant appeal to the Central Limit Theorem.

4.3 RESULTS FROM ONE WAY ANALYSIS OF VARIANCE

One way analysis of variance is a statistical procedure which is based on the variability of the scores (ie. total variance as it is made up of between and within group variance), in an attempt to see to what extent the means from each group differ.

The results from the ANOVA appear in Table 6.

TABLE 6: ANOVA TABLE

SOURCE OF VARIANCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES
BETWEEN GROUPS	12.80	3	4.27
WITHIN GROUPS	300.18	40	7.50
TOTAL	312.98	43	-

F value = 0,569 Tabulated F value =2,84

Therefore F= 0.569 is not significant at the o,05 level.

The one way analysis of variance assumes that the four groups come from normally

distributed populations with equal variances. If the four means are significantly different one rejects the null hypothesis which states that there is no difference between the experimental groups or samples.

The results of the one-way analysis of variance show that the data does not support the research hypothesis that question order will affect the accuracy of recall. The sequencing of questions to match the order of events did not, significantly affect the quality of the recall for the event. The within group variation was far greater than the variation between groups. This will be explored in the qualitative analysis of the questions.

4.4 RESULTS FROM KRUSKAL-WALLIS TEST

The results from the Kruskal-Wallis test can be found in table 7 in Appendix F. The test statistic H (corrected to make provision for tied ranks) = 1,27. Therefore the null hypothesis cannot be refected as 1,27 is less than 7,815 at a o,o5 significance level. These results do not support the hypothesis that the sequence of which questions match the order of events, significantly effect the quality of recall of these events.

The results of both analyses did not support the hypothesis that the question order significantly effected the quality of recall of the event witnessed event.

There were no significant differences between the groups, large individual differences were apparent within groups. A descriptive analysis of the response styles of the individual child may prove to be a useful source of information for future research. The descriptive analysis will be elaborated on in the section 5.1.4. Tables two through to five, show the individual raw scores and the squares of scores which were utilized in calculating the ANOVA table.

These table have a breakdown of the groups with regards to sex and language which are included for discussion purposes.

TABLE 2: GROUP 1 (CORRECT TIME SEQUENCE)

SUBJECT	AGE	HOME LANG. FIRST SECOND	SEX	RAW SCORE	SQUARES
1	6.6	F	MALE	7	49
2	6.11	F	MALE	6	36
3	6.8	F	MALE	4	16
4	6.3	F	FEMALE	8	64
5	6.2	F	FEMALE	5	25
6	6.11	F	FEMALE	3	9
7	6.3	F	MALE	2	4
8	6.3	F	FEMALE	5	25
9	6.8	F	FEMALE	0	0
10	6.9	F	MALE	5	25
11	7	F	FEMALE	7	49

TOTAL X = 6,5 52 302

TABLE 3: GROUP 2 (RANDOM ORDER)

SUBJECT	AGE	HOME LANG. FIRST SECOND	SEX	RAW SCORE	SQUARES
12	6.10	F	FEMALE	6	36
13	7	F	MALE	0	0
14	7.11	S	MALE	7	49
15	6.10	F	FEMALE	3	9
16	7.6	F	MALE	1	1
17	6.8	F	FEMALE	6	36
18	6.10	F	FEMALE	6	36
19	6.7	S	FEMALE	6	36
20	8	S	MALE	5	25
21	6.10	F	FEMALE	6	36
22	6.7	F	MALE	0	0

TOTAL X = 7 46 264

TABLE 4: GROUP 3 (MAIN EVENT)

SUBJECT	AGE	HOME LANG. FIRST SECOND	SEX	RAW SCORE	SQUARES
23	7.8	F	MALE	4	16
24	7	F	FEMALE	5	25
25	6.7	F	FEMALE	4	16
26	6.8	S	MALE	1	1
27	6.7	F	MALE	6	36
28	6.10	F	FEMALE	6	36
29	6.7	F	MALE	6	36
30	7.7	S	FEMALE	0	0
31	7.5	F	MALE	0	0
32	6.10	S	MALE	6	36
33	6.10	F	FEMALE	3	9

TOTAL X = 6.9 41 211

TABLE 5: GROUP 4 (REVERSE ORDER)

SUBJECT	AGE	HOME LANG. FIRST SECOND	SEX	RAW SCORE	SQUARES
34	6.9	S	FEMALE	0	0
35	6.9	F	MALE	0	0
36	6.11	F	FEMALE	8	64
37	6.11	F	FEMALE	0	0
38	7.3	F	MALE	6	36
39	7.3	F	MALE	5	25
40	6.11	F	FEMALE	7	49
41	7.2	S	FEMALE	7	49
42	7.2	S	MALE	3	9
43	6.5	F	FEMALE	0	0
44	6.10	S	FEMALE	0	0

TOTAL X = 6.9 36 232

CHAPTER 5

DISCUSSION

5.1 EVALUATION OF PRESENT RESEARCH

As individual differences were great within groups the question arose as to the choice of the experimental method for this study. Descriptive studies with young children may be more valuable. Before turning to look at the descriptive data obtained the present research will further be evaluated by discussing four areas. **Firstly**, the subjects who comprised the final sample are focused on so as to highlight the final composition and the distribution of the subjects into the four groups. **Secondly**, the Incident is critically analyzed to ascertain what transpired and how successful it was. **Thirdly**, we will look at the actual interviews and note any difficulties pertaining to these. **Finally**, the questionnaires were evaluated with particular attention paid to the questions. While there were no significant differences between groups there were large difference between scores. A descriptive analysis of the children's responses will therefore be explored.

5.1.1 EVALUATION OF THE SAMPLE

The sample is evaluated by looking at the child's home language, age and sex of the subjects.

It is interesting to note that although the subjects were divided randomly into the four groups there was a relatively even distribution of **home language** across three of the groups. Group one, however, had predominantly English home language subjects. With regards to the scores relating to the home language of the groups there was an even distribution of high and low

scores across the groups. This substantiates the earlier assumption that the children at the school where the medium of instruction is English, were all fluent in English. (The average score for the first language subjects was 4,1 and the average score for the second language subjects was 3,5). There were however, a few specific questions which revealed a higher percentage of errors by second language subjects, which will be discussed at a later stage.

With regards to the distribution of **females** and **males**, there were marginally more females (n= 24) than males (n=20) in the final sample. Their performance, as ascertained by the average scores, indicated that the girls had marginally higher scores (average score = 4,2) than the boys (average score = 3,7). There was some variation in how individual questions were answered by males and females. Research is inconclusive in this regard with Trankell (in Raskin, 1989) demonstrating that women perform worse than men do, and Geiselmen, Fisher, Mackinnon and Holland (in Raskin, 1989) suggesting that there is no difference between men and women. Further research is needed with particular emphasis on gender difference in child witnesses.

The **age** range within the four groups reflected a fairly wide range. The youngest in the sample being six years and two months and the eldest being eight years. Despite the variance of the ages in the sample as a whole, they were relatively evenly distributed between the groups. Scores obtained from younger subjects were no lower than that of the rest of the sample. There was no pattern associated with the types of errors made and the age of the child. However, as age has been found to be an influencing factor on recall it is suggested that future research should not neglect to control for age.

5.1.2 EVALUATION OF THE INCIDENT

The subjects were very attentive during the contrived incident and showed no signs of anxiety or distress. They displayed curiosity relating to why and how the time was to be spent in the video room. They furthermore showed enthusiasm for the video in which they became very engrossed. The decision to stop the video when the Research Assistant entered was the correct one, given the appeal of the video, most of the children would have been oblivious of the Research Assistant entering and exiting the room. They were very curious about who he was and why he needed the overhead projector. They verbalized that they had never seen him in the school before. They were very perceptive and watched with interest as he attempted to remove the projector without unplugging it. They were very quick to offer a suggestion that he should unplug the projector at precisely the same time as the Researcher made the suggestion.

When the Research Assistant had difficulty opening the door "Scott", being one of the subjects immediately came to his rescue as he attempted to open the door with his foot. Using his foot was a very dramatic and humorous way to try to open the door. This caught the children's imaginations and appeared to be remembered far better than the other two methods, perhaps due to the visual appeal thereof.

The subjects were very aware and commented that the Research Assistant did not use the projector for very long, returning it only after a very short period of time. The group as a whole were very focused on the research assistants entry and exit from the room. They were however easily able to shift their focus back to the video. Having witnessed the incident they returned to their classroom without any mention by the Researcher or teachers of the incident

or the video. By commenting on the length of time that the Research Assistant used the projector suggests that they were very attentive during the experiment. The comments that they made should perhaps have been incorporated into the questions as this may have facilitated the accuracy with which details were recalled.

5.1.3 EVALUATION OF THE INTERVIEWS

The training method utilised for interviewers was successful as were the criteria for selection. The interviews, as had been planned took place two days after the children had witnessed the incident. The interviewers did not have any prior knowledge of the incident and no prompting took place.

They used the standardized instructions as laid out in the previous chapter. It was felt by the interviewers that the children were initially confused about the questions as they kept on responding about the video as opposed to the incident. The interviewers having interviewed one child each met briefly with the Researcher to discuss any problem areas. It was at this time that the confusion was raised. The Researcher then asked the interviewers to emphasise to the child that the questions were about the day and not about the video. This was done by using the standard instructions, however, the section relating to the questions and the video were emphasized. This appeared to have cleared up the confusion with subsequent interviews.

The interviewers noted that none of the children were under any stress, they were all very enthusiastic about the individual attention. The timing of the data collection probably had something to do with their confidence. Should this have been done in the first term they might not have been as willing to participate, given their anxiety about being in a new school.

The interviewers further noted that they seldom had time to repeat the question before the child shouted the answers out aloud.

The children were happy about not discussing the questions with their peers. During the debriefing they were given an opportunity to discuss the questions with their peers. Each child was given a token of thanks which was received with much delight. They appeared to have enjoyed participating in the research and took great pleasure in telling their teacher about the incident, noting of course the "stupidity" of the Research Assistant in not knowing how to open the door or forgetting to unplug the projector.

An unexpected **practical difficulty** arose during the interview process.The date and time for the incident and the interviews were scheduled and confirmed in writing months prior. It was however unfortunate that a performance was scheduled for the same day which was not divulged to the Researcher until she and the interviewers arrived at the school. The interviews were therefore disrupted. Some were done before and some after the tea break, the remainder were done after the school had watched a performance by visiting artists. This broke the interviewing up into three sections. It had been originally hoped that all the interviews could be done continuously without any interruptions from first thing in the morning until the first tea break. This would have given all the subjects an equal opportunity to perform at their best, preventing any fatigue. This was not possible, as a result the interviews had to be staggered throughout the day with the last interviews occurring just prior to the end of the school day. This was very frustrating for the interviewers and teachers alike, given the disruption to their

classes. The effect that this had on the pupils participating in the research project is unknown, one can only speculate that the performance they watched may have led to some fatigue.

5.1.4 EVALUATION OF THE QUESTIONS

The questions used in the four protocols were very clear, and easy for the children to understand but on analysis of errors made there were some apparent difficulties. Short answers were required for each question. It was decided to use only ten questions in total, the children answered all ten questions in a very short space of time. Perhaps if more questions were used it may have facilitated the distinction between the four protocols. Although a statistical difference was not found between the four groups it was apparent that individual differences were great. A descriptive evaluation of what was observed will follow.

The children's responses in each protocol were examined to establish which of the questions had:

* Highest correct responses
* Lowest correct responses
* Highest "No response" responses
* Highest incorrect responses

Table 8 lists the question numbers that fell into the above mentioned categories.

TABLE 8: ANALYSIS OF QUESTIONS

GROUP	QUESTIONS			
	HIGHEST CORRECT RESPONSE	LOWEST CORRECT RESPONSE	HIGHEST "NO" RESPONSE	HIGHEST INCORRECT RESPONSE
1	8	5;2	1;2;3;9;10	5
2	6;8	3	3	5
3	7	5	1;2	5
4	6;8	2;3;9	2;4	5

5.1.4.1 HIGHEST CORRECT RESPONSES

It is apparent from the analysis of the responses that the question which received the highest number of correct responses was question eight. This was true in three of the four groups. Question eight was, "When he returned the thing he borrowed where did he leave it?" The correct response to this question was "On the table". 77% of the subjects were correct in their response to this question. The answer required from this question is a very easy familiar term for the children in addition to which it could be visualized. This could be the reason for the accuracy of the retrieval of this information. Question six was also answered correctly by most subjects in group two and four. This question was "What was the last way he tried to open the door?" The correct response was "He used his foot". As previously mentioned this action by the Research Assistant evoked a response from the children who saw his actions as being very humorous. The appeal thereof could have contributed to the accuracy of recall. Finally,

question seven received the highest score from group three. This question was, "Who helped him to open the door?" the correct response being "Scott". The reason for this detail being remember by this group could be due to the fact that "Scott" is a familiar figure and therefore would be recalled more accurately. This observation lends support to the research of Goodman, Rudy, Bottoms and Aman (1990).

5.1.4.2 LOWEST CORRECT RESPONSES

The lowest correct responses were ascertained by combining the number of "no response" responses with the number of incorrect responses. Thus giving us an overall indication of which questions were answered poorly. Questions two, three and five had the lowest number of correct responses. The reasons for the low response to these questions are discussed under the next two headings.

5.1.4.3 HIGHEST "NO RESPONSE" RESPONSES

Questions one, two and three had the highest occurrence of "No Response" responses. Question one was, "When you were watching a video, what did a man come in and ask to borrow?" The correct response was "an overhead projector machine". The projector was assumed to be a familiar object to the children, however, the word "overhead projector" may not have been. This could have accounted for the low number of responses to this question. Seventy percent of the boys answered question one incorrectly or gave a "no response" response to this question. It is difficult to ascertain why this should be so, further investigation is needed before one can decide if gender has a significant role to play in the accuracy of recall. This question was the only question requiring the children to label the projector. The children who were unfamiliar with the word "overhead projector" used other

ways to describe it, for example, machine; the thing that makes the light go on; the thing that puts pictures on the wall. Research by Flin, Stevenson and Davies (1989) which investigated the vocabulary usage in questions would supports this interpretation of the data. Question two was, "What did Mrs Birkett ask him to remember?" The correct response was, "He had to bring the projector back". This question was poorly recalled possibly due to the fact that it relies on semantic memory (van Dokkum, 1995). The answer could not be concretely visualized by the children perhaps resulting in an inability to retrieve the information. There were a wide variety of responses to this question. For example, `to knock on the door'; `to bring the paper back'; `to close the door', illustrating the confusion as a result of an inability to form a clear picture in their minds about the event. Question three, was also poorly responded to, the question was, "What was packed on top of the thing that he came to borrow?" the correct response was "books". The low rate of accuracy on this question could be accounted for by the fact that the mirror at the top of the projector may have distracted the children. Many of the children replied that a mirror or papers were on the projector. possibly due to the distraction of the mirror they may not have noticed the Research Assistant removing the books.

5.1.4.4 HIGHEST INCORRECT RESPONSES

The highest occurrence of incorrect responses (excluding the "No response" responses) was that of question five. Across the four groups this question had the highest number of incorrect responses. Question five is, "When he got to the door how did he first try to open the door?" The correct response was "he used his chin". There are two possible reasons for the inaccuracies found in the responses. Firstly, the subjects may have had a problem with sequencing. It is assumed that children from the age of six and seven are familiar with the

ordering and sequencing of details, such as first, second and third. Whilst this is assumed one needs to take into account individual differences. This should be noted when children are required to give evidence. Secondly, the vocabulary in naming parts of the body was assumed to be understood by children of the age in this study but types of errors indicated that this may not have been justified. Question five was incorrectly answered by eighty percent of the second language subjects. Whilst this question was answered poorly by all subjects a greater percentage of the second language subjects failed to answer this question correctly. A possible explanation for this could be due to the fact that second language subjects may have been even less familiar with sequencing or the exact naming of parts of the body.

5.1.5. TYPES OF ERRORS MADE

It becomes apparent by looking generally at the individual answers and errors made that a number of factors may have contributed to the inaccuracies observed. Which in turn may have influenced the statistical outcome of the between group comparison. Factors observed were, Firstly, the confusion between **fantasy and reality.** A number of children confused the video and in particular the "Duck" with the real incident which was observed. These children suggested that the duck helped the Research Assistant to open the door. Not only was a character from the video included in their recall of the event but yet others included fictitious characters such a "a monster" and "a monkey" which were not seen in the video. These results are consistent with the findings of Goodman and Aman (1990); Rudy and Goodman (1991) (in Saywitz, Nathanson and Snyder, 1993). This highlights the need to investigate to what extent fantasy and reality issues do contribute towards the inaccuracies in testimonies of children, as suggested by Fouché and Hammond (1987).

Secondly, there was evidence of **exaggeration and confabulation**, in some of the responses to the question "What was different about the man when he brought it back?". Some children answered that the Research Assistant got `bigger' and `ate something' before returning the projector. They did not notice that he had put on a green coat.

Thirdly, **interference** was observed in that the children were fascinated by the mirror on the projector, as a result of this distraction they did not notice the books being taken off the projector. This factor was discussed previously in the section 2.2, in which a number of factors were discussed that influence the quality of the stored information. Research by Loftus (in Cutshall and Yuille, 1989) highlights the effects interference has on the accuracy of recall. The duration of the actions during the event may also have contributed towards the subsequent recall of the actions. This is supported by Bothwell, Deffenbacher and Brigham's (1987) research.

Fourthly, many children called the books "papers", in answer to question three, "What was packed on top of the thing that he came to borrow?" suggesting that they did not pay attention to detail. This was further demonstrated, by the use of the word "jersey" as opposed to the correct word "coat or jacket" in response to question nine. The lack of **specificity** in some children's responses has important implications within a forensic setting. The findings of this research suggest that claims made by Neisser (in Fouché and Hammond, 1987) that children attend to more details than do adults should be evaluated with caution.

Fifthly, **sequencing** difficulties, were demonstrated in the responses to questions five and six. The children were asked which was the first and last way the Research Assistant attempted

to open the door. It may therefore be important to establish the individual child's level of acquisition of this ability before questions of this kind are asked.

Sixthly, the **vocabulary** required on some of the questions may have contributed towards the accuracy with which those questions were answered. Some children appeared to be unsure of the names of parts of the body and could not name the overhead projector. One should be aware of this when interviewing children as was demonstrated by Flin, Stevenson and Davies (1989).

Finally, **familiar** figures and objects were recalled far better than unfamiliar figures and objects. The boy Scott was a familiar figure to the children and as a result was remembered better than the Research Assistant who was unfamiliar to them. Questions requiring responses which contained familiar objects or words, for example the table, were answered more accurately. Heydon (1984) support this notion and suggests that details witnessed by a child which are not of personal significant to their own world is quickly forgotten by them.

In conclusion, the above descriptive analysis of the questions and the types of errors made reveals a need for further descriptive research in this area. It is furthermore evident that assumptions made about children's understanding of their world and about what they know need to be carefully examined prior to embarking on experimental studies. It is necessary to bear in mind that individual differences are important to recognize when investigating young children's responses to questions. In addition to which any assumptions that are made must be carefully established with particular emphasis on the context of the child's world and how they respond to it.

5.2 LIMITATIONS OF THIS STUDY

A number of limitations of this study are noted.

Firstly, the sample in this research project was fairly small. The size of the sample in this study, may have contributed to the results which were obtained. Ideally a larger sample of children would have increased the validity of the study. Furthermore sampling may have been more evenly distributed if a number of subjects were taken from a larger number of schools so as to broaden the base from whence the sample was drawn. Caution should therefore be exercised in drawing generalised conclusions from this study.

Secondly, the developmental perspective is an area which was not fully explored in this research. One needs to determine whether or not there exists a developmental progression with regards to storage of information according to the sequence of events in which they happened. Research which includes children from a number of different developmental stages may reveal a trend which would shed light on this issue.

Thirdly, some basic assumptions upon which the study was based need to be re-evaluated. The assumption that the "Peabody Picture Vocabulary Test" would ensure a general level of **language ability** was made. This test, tested the receptive language ability of the children but failed to indicate what their expressive language ability was, thus assuming that their expressive and receptive language abilities were similar. It may be more expedient in future to screen subjects more carefully to ascertain their receptive and expressive language competencies and level of English language acquisition. It was further assumed that **free recall** would not be valuable with the age of the children in this study. Further research can

be generated from this project which could focus on giving the subjects an opportunity to use free recall prior to embarking on the specific questions. This would possibly reveal to what extent free recall prior to specific questions improves or inhibits recall. This study assumed the children's **language comprehension** was such that the questions could be answered without any difficulty. This should be tested by vigorous pre-test trials. Finally it is important to **contextualize** the children's responses. By doing so a fuller understanding of the answers may reveal some interesting findings.

Fourthly, in this study the inter-scorer test reliability was not examined. All answer sheets (44 in total) were marked and scored by the Researcher. Likewise while efforts were made to control for interviewer effects, individual variation in style was not directly addressed. These limitations and those noted in section 5.1.5. highlight the need for the development of a conceptual framework when conducting research of this kind with young children. The need for further research within such a framework cannot be over emphasised as to date little progress has been made in the areas of need as noted by Goodman (1984).

5.3 SUGGESTION FOR FURTHER RESEARCH

Broadly speaking in the area of "children as eye witnesses" further research needs to focus on a number of different areas so as to facilitate a better understanding of children's ability to be reliable witnesses. Goodman stated as early as 1984 that a number of areas needed further research. Many of these areas are still in need of research today.

Firstly, areas pertinent to the child's ability to provide accurate testimony; emotional trauma which is likely to be experienced by the child witness; the perceived credibility of the child's testimony and the accuracy of the child's testimony needs to be researched in real-life situations. Very few current studies have examined long-term memory for realistic, live events similar to those which children are called upon to testify about. It is suggested by this author that researchers need to address this area by confronting the complexity of the context in which children are required to be witnesses. Analysis of actual testimony in the form of case studies may be a more enriching approach to research in the area. Methods of analysing such rich contexts are available but under utilised in psycho-forensic research with children.

Secondly, it is suggested that trained professionals should be employed to interview children during pre-trial investigations. Stern (in Goodman, 1984) suggested that a child psychologist who is specially trained in memory development and forensic psychology should interview child witnesses as opposed to police officers who have no training in these areas. Parker (in Goodman, 1984) suggested that lawyers should be specially trained in child development. In addition nursing or social workers could assume the role of interviewer in cases pertaining to child witnesses. Effective communication between the interviewer and the child witness will depend largely on the ability of the former to communicate with children in appropriate language and about concepts that they can understand. It is therefore necessary to mould questions to the child's stages of language and cognitive development. It is for this reason that Saywitz, Nathanson and Snyder (1993) suggest that legal professionals are unable to do this given their training which entails very little instruction in child development. Pynoos and Eth (1984) suggest that psychiatrists or mental health officials are needed at the pre-trial stage. The argument put forward here is that a child's testimony accuracy may be increased when

emotional blocks are removed. By having trained professionals asking the questions it will prevent the necessity for repeated questioning with repeated interviews. They will furthermore use terminology which is understood by the child, this will prevent the child from making mistakes in answering questions that they do not understand. Police interviews have been known to be haphazard and not carefully thought out and as a result a decrease in the accuracy of the child's testimony may be due to poor questioning techniques. It is necessary through the process of questioning to mentally recreate the exact sequence of events, which will facilitate the retrieval process. Therefore successful retrieval will be determined by how compatible the questions are. Given this, further research is needed to establish what qualities and skills are needed by the interviewer to increase the reliability and accuracy of the child's testimony.

Thirdly, research which has focused on the child's ability to distinguish fact from fantasy (for example, Johnson and Foley 1984) has identified where children have trouble in this regard. Goodman (1984) suggests that research in this area needs to be broken into sub-questions that will help one to pinpoint the child's actual deficits in this area. Fouché and Hammond (1987) support this notion and suggest that further research in this area is needed. The question is raised as to whether children make up answers when they do not know the correct ones, or whether this is the product of a power differential between the adult interviewer and the child witness. It is further argued that they make up answers to questions that they have not understood. This highlights the need to ask questions which are clear and fully understood by the child in a psychologically supportive context.

Fourthly, according to Goodman (1984) further research should focus on the minimization of trauma. This trauma relates to the trauma of witnessing or experiencing a crime and in addition to the trauma experienced in the subsequent legal involvement. Further research is needed with regard to the latter, the emotional effects caused by the legal processes experienced by the child witness. An earlier study by Gibbens and Prince (in Goodman, 1984) reported that child sexual abuse victims who were involved in court proceedings experienced greater trauma than those who were not involved in the court proceedings. We need to know whether court appearances are harmful to some and beneficial to others and how to distinguish between these groups.

Research is needed on children's perception of the trial settings, this would help one to define the psychological demands of courtroom environments and the possible effects on children's competence to testify. This type of research would also serve to assist one in preparing children for trial (Melton, Petrila, Poythress and Slobgin, 1987).

Lastly, research which focuses on the credibility of child witnesses needs to be undertaken. This research could be conducted to verify whether or not competence examinations are valid and reliable measures of a child's ability to provide an accurate testimony.

There is a crying need for more research with regard to all aspects of children as eye witnesses. Carefully conducted research could greatly contribute to our knowledge of children's abilities as witnesses, techniques for obtaining accurate testimony, the treatment and emotional needs of the child witness and the child's credibility. So far the tip of the iceberg has only being uncovered.

5.4 CONCLUSION

From this study it emerged that the order in which questions were asked did not affect the accuracy and the completeness of the recall of a contrived incident. The limitations of this particular study should be noted. The descriptive analysis of the responses and the types of errors made by the subjects in this study indicate a need for further descriptive research. In addition a richer understanding of children and how they view and respond to their world is necessary.

Whether one uses free recall; yes\no responses; open ended questions or short answers to specific questions, accuracy and reliability of children's testimony may also be determined as a function of the skill of the interviewer. Perhaps more attention should be paid to developing skills in interviewing or ascertaining what the important characteristics are which make one interviewer more effective than another. It is true to say that the answers we receive depend on the questions we ask, it is therefore important that we ask the correct questions.

While the Cognitive Interview has been shown to be effective with adults it is on occasion necessary to ask specific questions. This is particularly so when interviewing children. Research has shown that children may not place importance on peripheral details which may be important for the court proceedings. It is therefore the job of the interviewer to ask specific questions so as to obtain a fuller picture of the events that occurred.

By focusing on the temporal order of the event, it was suggested that this would help the child to reconstruct and reinstate the context which in turn would help with the retrieval of the information. While the results of this study were not significant larger samples and questions

which are carefully designed, so as not to make assumptions about young children's language and comprehension ability may revealed more significant results. The age of the children chosen for this research was very specific. A study of children at different stages of development could highlight whether or not there exists a developmental trend to question order and recall.

The literature suggests that an event which is witnessed is stored, comprehended and encoded according to the script or schema of the event. Therefore retrieval should be more effective if the cognitive process initiated by the question matches the structure in which the memory was made. The literature is convincing in this regard and it is therefore suggested that further research is needed to ascertain to what extent this is true when working with children.

CHAPTER 6

CONCLUSION

Common sense tells us that the manner in which a child is interviewed will affect the way in which the child testifies. Knowing this and proving through psychological research is, however a difficult task.

Current research indicates that children possess the memory skills needed to give evidence provided they are asked simple direct questions in a neutral and supportive way. Attention needs to be given to the interviewing techniques utilized with child witnesses. A number of variables within the interviewing process and the questioning techniques used may have a significant effect on the accuracy of recall. It is for this reason that careful consideration of this process is needed to enhance the reliability and accuracy of child witnesses.

The child's competence and credibility as a witness is an area of heated debate. Saywitz, Nathanson and Snyder (1993) conclude that the child's ability to report and communicate what happened during an event will largely be influenced by the stage of development; the adults ability to ask age appropriate questions; to clarify potential misunderstandings and the adults ability to understand the child's idiosyncratic beliefs.

Another area of debate which has received attention is that of laboratory studies and real life situations. Some critics are of the opinion that eyewitness laboratory research and real world witnesses are far removed and as a result do not offer any useful guidelines for real cases.

Psychological research into the claim that children are as competent as adults in giving testimony is incomplete and in some cases contradictory. Haugaard (1988) warns us that the evidence supporting children's competence has come almost entirely from laboratory studies and as a result the extent to which these can be generalized to real courtroom situations is still unknown. He further cautions that the gaps that exist in research leave us with many unanswered questions with regard to children's honesty on the witness stand and their ability to recall an event independently.

Others such as McCloskey, Egeth and Mckenna (1986) have raised the issue of the ecological validity of laboratory research. Newell, Tulving and Madigan (in Cutshall and Yuille, 1989) have expressed concerns about the narrowness of most memory research and have questioned the generliazability of laboratory findings to real life situations. Malpass and Devine are quoted as saying:

> "No matter how well executed or elegant our studies are, they will be of questionable relevance at best without a knowledge of the differences between eye witnessing and real situations compared with research situations," (1981,p.344).

In summary laboratory work has a number of limitations:

1. Laboratory research creates situations far removed from those that a child witness would face.
2. The length of time between event and recall in a laboratory study is much shorter than occurs in real life between the event and the date of trial.
3. There is no overt or covert pressure placed on the child in the laboratory research

whilst sexually abused children may perceive pressure from a number of other people to testify in a particular way.

4. In real life child witnesses may be coached on how to answer and may be badgered on the witness stand, both would not happen in laboratory studies.

The debate continues as most research has focused on contrived laboratory studies, most information about real situations has been anecdotal.

The research in this study was of a simulated type and utilised an experimental method. Given the criticisms lodged against this type of research it is noted that while direct parallels cannot be drawn between contrived simulated studies and real cases involving traumatized witnesses, the Researcher intended to highlight the need for research focusing on the interviewing process. Research in this vital area may help to clarify some misconceptions about child witnesses. Research of this nature could shed some light on the accuracy of recall within a developmental perspective which may contribute to our understanding and may prompt changes within the legal field. It would also strengthen the arguments of advocates of the child's right to a trained child interviewer who is sensitive to the particular demands of child interviewing.

Haugaard (1988) recognizes the need for care in the application of laboratory research to legal policy, however, he recognizes the utility of laboratory research for testing assumptions pertaining to the social and cognitive capacities of children. Ecological validity need not necessarily imply that research findings which were not obtained from field research should be rejected.

It is important to note that the inability of children to sometimes recall the details of an incident may not necessarily be a failure or shortcoming with regards to memory but may be a failure to retrieve information possibly due to the interview techniques used. Research has indicated that the amount and accuracy of recall can be greatly enhanced if the interviewer provides the child with a clear and logical structure for their memories. How this may be achieved is the question at hand. While the method employed in this study did not demonstrate a significant affect of question order, limitations in the studies design may well have accounted for the results. Further investigation of this area is still warranted.

Research needs a shift in focus firstly, to ways of improving the accuracy of a child's recall as opposed to focusing on ways to discredit child witnesses. By better understanding how children respond to the interviewing process, future research may produce more reliable results. Secondly, a shift is perhaps needed from more traditional types of experiments to more qualitative sophisticated research designs within a developmental psychology perspective so as to gain a fuller understanding of the child's world. A more comprehensive understanding is needed of children particularly of how they think and communicate about their world. A more indepth look at developmental psychology may provide us with a better understanding of children within the psycho-forensic arena.

> "The fields of psychology and law share, in principle, at least one common goal - to find the truth about social events. Psychologists often pursue this goal through research, while the courts pursue it through court proceedings. It sometimes happens that a child is the only one who knows the truth. In such cases social scientists and legal professionals must join together, turn to the child and know when and how to listen", (Goodman, 1984, p.173).

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APPENDIX A

Dear Parent,

I am presently completing my final year of training as an Educational Psychologist. As part of my course it is necessary for me to undertake a research project with children. I have decided to use Class one children for my research which will be investigating Information Processing and Memory skills of six and seven year old children.

The children will not be exposed to any stress in the course of the research. The children's identities will not be published. Mr _____ has given me permission to use _____ School for Research purposes. Should you wish your child to participate please complete the form below and return it to the class teacher.

Thank you for your co-operation.

Yours Sincerely

MARGARET BIRKETT

.....

I give permission\ do not give permission (delete which is not applicable)

for my child ..... to participate in the research project.

(PLEASE DETACH AND RETURN TO THE CLASS TEACHER)

APPENDIX B

NAME _____

AGE _____

LANGUAGE GROUP _____

SEX _____

QUESTIONNAIRE PROTOCOL
NUMBER ONE

1. When you were watching a video, what did a man come in and ask to borrow?

2. What did Mrs Birkett ask him to remember?

3. What was packed on top of the thing that he came to borrow?

4. What had he forgotten to do before he could carry it out of the room?

5. When he got to the door how did he first try to open the door?

6. What was the last way he tried to open the door?

7. Who helped him to open the door?

8. When he returned the thing he borrowed , where did he leave it?

9. What was different about the man before he brought it back?

10 What did the man say when he brought it back?

COMMENTS

APPENDIX C

NAME _____

AGE _____

LANGUAGE GROUP _____

SEX _____

QUESTIONNAIRE PROTOCOL
NUMBER TWO

1. Who helped him to open the door?

2. When he got to the door how did he first try to open the door?

3. What was packed on top of the thing that he came to borrow?

4. When he returned the thing he borrowed , where did he leave it?

5. When you were watching a video , what did a man come in and ask to borrow?

6. What was the last way he tried to open the door?

7. What did the man say when he brought it back?

8. What did Mrs Birkett ask him to remember?

9. What was different about the man before he brought it back?

10 What had he forgotten to do before he could carry it out of the room?

COMMENTS

APPENDIX D

NAME _____

AGE _____

LANGUAGE GROUP _____

SEX _____

QUESTIONNAIRE PROTOCOL
NUMBER THREE

1. When you were watching a video , what did a man come in and ask to borrow?

2. What had he forgotten to do before he could carry it out of the room?

3. When he got to the door how did he first try to open the door?

4. What was the last way he tried to open the door?

5. Who helped him to open the door?

6. What was packed on top of the thing that he came to borrow?

7. When he returned the thing he borrowed , where did he leave it?

8. What was different about the man before he brought it back?

9. What did the man say when he brought it back?

10 What did Mrs Birkett ask him to remember?

COMMENTS

APPENDIX E

NAME _____

AGE _____

LANGUAGE GROUP _____

SEX _____

QUESTIONNAIRE PROTOCOL
NUMBER FOUR

1. What did the man say when he brought it back?

2. What was different about the man before he brought it back?

3. When he returned the thing he borrowed , where did he leave it?

4. Who helped him to open the door?

5. What was the last way he tried to open the door?

6. When he got to the door how did he first try to open the door?

7. What had he forgotten to do before he could carry it out of the room?

8. What was packed on top of the thing that he came to borrow?

9. What did Mrs Birkett ask him to remember?

10 When you were watching a video , what did a man come in and ask to borrow?

COMMENTS

APPENDIX F

TABLE 7: KRUSKAL-WALLIS TEST

SCORE	GROUP	RANK	GROUP1	GROUP2	GROUP3	GROUP4
0	1	5.5	5.5			
0	2	5.5		5.5		
0	2	5.5		5.5		
0	3	5.5			5.5	
0	3	5.5			5.5	
0	4	5.5				5.5
0	4	5.5				5.5
0	4	5.5				5.5
0	4	5.5				5.5
0	4	5.5				5.5
1	2	11.5		11.5		
1	3	11.5			11.5	
2	1	13	13			
3	1	15.5	15.5			
3	2	15.5		15.5		
3	3	15.5			15.5	
3	4	15.5				15.5
4	1	19	19			
4	3	19			19	
4	3	19			19	
5	1	23.5	23.5			
5	1	23.5	23.5			
5	1	23.5	23.5			
5	2	23.5		23.5		
5	3	23.5			23.5	
5	4	23.5				23.5
6	1	32	32			
6	2	32		32		
6	2	32		32		
6	2	32		32		
6	2	32		32		
6	2	32		32		
6	3	32			32	
6	3	32			32	
6	3	32			32	
6	3	32			32	
6	4	32				32
7	1	40	40			
7	1	40	40			
7	2	40		40		
7	4	40				40
7	4	40				40
8	1	43.5	43.5			
8	4	43.5				43.5
TOTAL	-	-	279	261.5	227.5	222

H (with correction factor) = 1,27

Tabulated χ^2 - value = 7,815 at a 0,05 level therefore H (with correction factor) is