Children as Witnesses:
Memory recall and face recognition

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Cover picture by Mirella Fredin when she was 10 years old.
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Dedicated to my parents,
Sven and Gun Fredin,
who always will be in my heart

Abstract

Through centuries, witnesses to crimes have played an important role for the police to get a conviction of the culprit. This dissertation examined how accurate children are as witnesses of events and when participating in lineups.

In Study 1, participants were tested with free recall and focussed questions. Children aged 8-9 years, 11-12 years and adults in two experiments witnessed film events with forensic relevance. The results showed that the children in a free recall report can be as accurate as adults and as realistic in their confidence judgments of the correctness of their memories as adults. In Study 2, children, 10-11 years old and adults participated in sequential lineups arranged according to the Swedish Police instructions in experiment 1 and compared with elimination lineup in experiment 2. A staged crime video was used followed by lineups one week later. The results indicated that elimination lineups according to the Swedish National Police Board instructions is advantageous for children but make the task more difficult for adults. Compared to experiment 1 with sequential method the children had increased correct identifications in target-present lineup and decreased false identifications in target-absent lineup. Study 3 investigated if self-perception and self-doubt correlates with accuracy and confidence. The result indicated was that at least in target-absent lineup one must be careful to relay on a child witness with strong self-confidence.

The results of this dissertation indicate, that given the appropriate types of questions and forms of questioning children can be fairly trustworthy witnesses, sometimes at the level of adults. Participating in a lineup the children performed at a level comparable to adults when the target was in the lineup. With target-absent lineup, children made more false identifications than adults. Target-absent lineups, with children, also had negative correlations to accuracy.

Keywords: child eyewitness, event memory, question format, confidence, sequential lineup, elimination lineup.

Acknowledgments

Finally I reached the goal and it is time to defend my dissertation. The road has been long with various impediments that have occurred over the years, but also a huge number of positive events.

My father Sven died early in this journey, which made me extremely sad because he was so proud that I entered the doctoral studies and also because he stood surety for my funding during the first two years. I had never been where I am now without him. Thank you, beloved Dad!

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List of Papers

The thesis is based on the following studies that hereafter will be referred to by their Roman numerals.

I. Allwood, C.M., Innes-Ker, Å., Holmgren, J., and Fredin, G. (2008). Children's and adults' realism in their event-recall confidence in responses to free recall and focused questions. *Psychology, Crime & Law*, *14*, 529-547.

II. Fredin, G., Allwood, C.M., and Bengtsson, H. Childrens' accuracy and confidence in modified sequential vs. elimination lineups.
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Introduction

Children become involved in the legal system in numerous ways. They can be victims, witnesses and offenders. Society faces a number of difficulties as it struggles to accommodate these children within the legal context. Ideally, relevant law and the police ought to be informed by empirical evidence from theoretically sound research. This dissertation aims to increase our knowledge about children as witnesses.

Every year, approximately 4,500 people in the United States are falsely convicted because of false witness identifications (for a review see Penrod & Cutler, 1999). This issue is not specific or limited to the United States; the problem also exists in the rest of the world. During the 1980's and the 1990's, forensic researchers reviewed the empirical evidence at hand and concluded that the format for lineups ought to be redesigned. This resulted in new recommendations in the US (reviewed in Wells, Small, Penrod, Malpass, Fulero, & Brimacombe, 1998) as well as in Sweden (RPS, 2005:2). However, in the United States these recommendations had very little penetrating power in the work of the police and the court rooms, until recently (Wells, Malpass, Lindsay, Fisher, Turtle, & Fulero, 2000, p. 630). According to my own experience, this is also the case in Sweden. When I have informally asked investigators in Sweden why they don't follow instructions, the answer is that they lack resources, both with respect to time and manpower.

In 1990, an instruction, the Swedish Krirapport (RPS, 1990:3) was published with specific instructions on how police officers should perform lineups. Fifteen years later, in 2005, the National Police Board in Sweden (RPS, 2005:2) published additional instructions, but they were still not conclusive. For example, there was barely anything in the instruction about how to perform lineups with children involved.

One of the most common occasions when a child becomes a witness is when s/he is exposed to abuse. In the 1980's, there was an increase in research on the issue of child abuse. The prosecutors argued that children do not lie about sexual abuse. Even if most cases of alleged child sexual abuse are true, some cases appeared in the 1980's and the 1990's that raised some fundamental concerns about the accuracy of children's statements. According to Bruck and Ceci (1999), the children's claims were often quite fantastic, suggesting ritualistic abuse, pornography and multiple victims. In these cases, there was seldom enough medical evidence and no adult witnesses to confirm the children's statements. A study by Rudy and Goodman (1991) examined how accurately four-year-old and seven-year-old children recalled an event as witnesses to another child's dealings with an examiner. The researchers concluded that, although there may be age differences in suggestibility for non-central features of an event, there were no age differences when children were asked misleading questions about central salient events; in fact, children are usually accurate when asked about such details. It is, of course, of great importance that the interrogator is capable of properly interviewing children. A review study by Ceci and Bruck (1995, reviewed in Bruck & Ceci, 1999) concluded that children could be influenced by interviewers' beliefs about an event. Children are also sensitive to the way in which questions are asked (see Bruck & Ceci, 1999).

A common view of the investigating officers is that a more confident witness is likely to be more accurate than a hesitant witness who appears somewhat unsure of the facts. The officer may thus pay much more attention to details given by a confident witness and less attention to those given by a less confident source. If there is a disagreement with regard to some important detail, the interviewing officer may tend to accept the version given by a confident witness much more readily than that given by a less confident one. However, this common-sense view may not necessarily be correct (Lindsay, Nilsen, & Read, 2000). Both of these aspects, confidence

and accuracy are attended to in this dissertation that aims to explore children's capacity in a witness situation with respect to their memory recall and the realism in their confidence judgment in event recall and face recognition.

This introduction first reviews some important aspects of human memory in a witness context. This is followed by an account of the development of memory recall in children. An inventory of different methods of lineups is made, followed by a section on children in lineups. Thereafter follows a review of estimator, system and postdiction variables, all of which may have an impact on witness reports. Next, confidence about event memory and the ability to identify culprits at lineups is accounted for and alternative methods to measure the probability of correct recall are described. Finally *the American Psychology/Law Society and Division 41 of the American Psychological Association's* recommendations for lineups are recounted together with the complements included in the Swedish National Police Board's recommendations.

Some important aspects of human memory in a witness context

All witnessing is dependent on people's memory. Memory is seen here to include metamemory, which comprises one's memory capabilities and strategies that can aid memory, as well as the processes involved in memory self-monitoring. This self-awareness of memory has important implications for how people learn and use memories. In this section, we take a closer look into the fact that cognitive abilities vary between individuals, particularly with respect to differences related to age and personal abilities. Adults' abilities both regarding memory and metamemory will be described first.

Generally, an investigator wants the witness to report as much as possible. Needless to say it is important that the reports are correct in order to convict the culprit in the end. Accuracy and quantity of what is reported can differ substantially between individuals. However, free report conditions, in which witnesses are implicitly or explicitly given the options either to volunteer a piece of information or to abstain, seem to increase the proportion of correct information. Under free report conditions, people tend to provide only information that they believe is likely to be correct, which implies that their performance is mediated by a decision process that avoid incorrect answers (Klatzky & Erdelyi, 1985; Koriat & Goldsmith, 1994). In court, when the witness takes place in the stand he or she is asked to tell the truth and nothing but the truth. The question is under what conditions the witness is able to do this. Koriat and Goldsmith (1996) presented a model that shows the process (figure 1) by which answers are hypothesized to be produced. Although the assumptions embodied in this model may seem straightforward, the implications for memory performance are not. According to the proposed model, the contributions of monitoring and control to free-report memory performance can be shown to depend on the following three factors: (a) *monitoring*

effectiveness – the extent to which the assessed probabilities successfully differentiate correct from incorrect candidate answers; (b) *control sensitivity* – the extent to which the volunteering or withholding of answers is in fact sensitive to the monitored output; (c) *response criterion setting* – P_{rc} level that is set in accordance with the incentive to be accurate (payoff schedule) (Koriat & Goldsmith, 1996).

When the witness is asked to recall a memory, it is of great importance how the task is presented. If an inappropriate instruction is used, the witness could be influenced in an undesired way by the interrogator. In recall situations, memory performance probably reflects a variety of metamemory and control processes that help the rememberer to achieve both implicit and explicit performance goals (Koriat & Goldsmith, 1996).

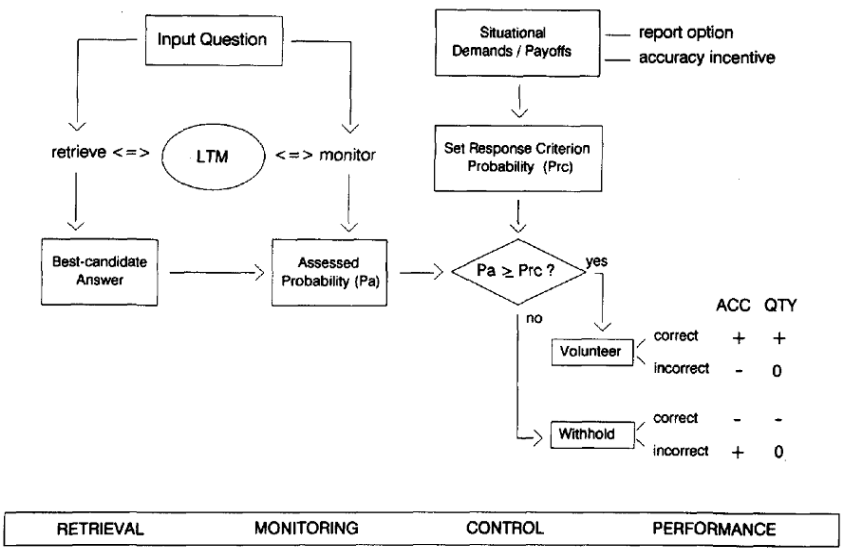

Figure 1. A schematic model of the strategic regulation of memory accuracy and memory quantity performance. Performance effects are signified by plus (increase), minus (decrease), and zero (no effect). LTM = long-term memory; ACC = accuracy; QTY = quantity; P_a = assessed probability; P_{rc} = response criterion probability.

Researchers argue that people can increase the accuracy of their memory reports by screening out answers that they feel are likely to be incorrect, not by enhancing the overall correctness in their answers. Lamb and Fauchier (2001) found that suggestive questions by the interviewer led to a disproportionately large amount of contradictions whereas open-ended invitations never elicited contradictions.

There appear to be some aspects of witnessed events in which humans tend to be wrong in a systematic way. If different witnesses view the same scene, there may be some details that they all agree on, but nevertheless are incorrect. One example is the duration of time in which a robbery took place. It has been shown that witnesses consistently overestimate the length of time such an incident takes. For example, Loftus, Schooler, Boones and Kline (1987) found that people who were shown a videotape of a simulated bank robbery estimated, on average, that the robbery took two and a half minutes. In reality, it only took 30 seconds.

It appears likely that, as far as perception and memory are concerned, there is an optimum level of stimulation that an event can provide. Thus, an extremely trivial crime may stimulate such a small amount of interest and attention that very few details are taken in and stored (e.g. a bicycle theft). On the other hand, a crime might be so terrifying that it literally overwhelms the witness's ability to process and store details accurately. Therefore, victims may only be able to provide little information about the event or the perpetrator. Based on these and similar findings, Deffenbacher (1980) found statistical support for his optimality hypothesis. Furthermore, he concluded that strong faith in the adequacy of certainty as a predictor of accuracy was not at all supported by the evidence.

Researchers agree that memories do not necessarily lie undisturbed until people are asked to recall them. Leippe and Eisenstadt (2007)

concluded that witnesses were more likely to agree with an incorrect identification and cued-recalled choices of other witnesses when they were uncertain about the difficulty of the memory task at encoding or retrieval. Witnesses also tend to incorporate, for example, overheard mistaken recall of co-witnesses into their own later recall to a greater extent when poor viewing conditions make them uncertain about what they have seen (Leippe & Eisenstadt, 2007).

Since memory capacity varies greatly between individuals, it is important to be aware of major cues to the memory. Three types of cues to accuracy rooted in metamemory are often referred to: *intrinsic cues*, *extrinsic cues* and *self-credibility. Intrinsic cues* refers to that people have learned to associate different acts of remembering with accurate or poor recall (Koriat, 1997). In face recognition, it may be the *speed* with which the sense of recognition emerges that serves as an accuracy cue. It could also be the *number* of qualities that comes to mind or how *easily* they can be retrieved (Leippe & Eisenstadt, 2007). The use of these types of cues has also been observed when witnesses answer multiple-choice questions about the culprit in a staged crime (Shaw Iii, 1996) or try to identify the culprit from a lineup (Sporer, 1992). *Extrinsic cues* may occur when the witness suggests a likely level of accuracy of their memory (Koriat, 1997). For example, the longer a witness is reassured that her/his memory is correct, the more confident s/he is that the memory actually is accurate (Read, 1995). *Self-serving* cues involve the metamemory assumption of correlated memories (Leippe, Eisenstadt, Rauch, & Stambush, 2006). For example, it appears when people judge themselves to have a better memory of events than others.

Age differences in cognitive development relevant to memory recall and identification of suspects in lineups

Children may be witnesses to a variety of crimes such as theft, vandalism, and murder. When children are the prime eyewitnesses to a crime, it is important for the police to know if they can trust the child's competence to identify the suspect. For crimes such as theft or sexual assault, a child may be the only, or the key, witness. Thus, they might be questioned by the police and may be asked to identify the suspect in a lineup. Throughout the centuries children have often been characterized as unreliable witnesses (Ceci & Bruck, 1993). Starting with the Salem Witch Trial in 1692, this assumption continued to dominate in the early 20th century with Wipple (in Ceci & Bruck, 1993) claiming that young children are highly suggestible and prone to make serious errors in their testimony, even when they testify about matters of great personal importance. The general finding is that younger children are more suggestible than older children and that children generally are more suggestible than adults (Blandón-Gitlin & Pezdek, in Bottoms, 2009). According to the broadest definition, suggestibility concerns the degree to which children's encoding, storage, retrieval and reporting of events can be influenced by a range of social and psychological factors. Stress may affect memory but Goodman, Hirschman, Hepps and Rudy (1991) found that children's memory was not affected by stress until a very high level of stress was reached. At that point, stress had a beneficial effect on free recall and resistance to suggestion. Correct free recall was not affected by age, but the ability to answer specific and misleading questions was age-related. Accurate face recognition was inconsistently associated with age (Goodman, Hirschman, Hepps, & Rudy, 1991).

Delay is a relevant factor in forensic settings because children commonly will not provide testimony about criminal acts until

weeks, months or even years after the original event. During this time, the child is exposed to many impressions. This could have an effect on her/his possibility to identify a suspect. Information stored in memory is likely to fade after long delays. The greatest loss of information occurs in the period immediately after an event. One factor that can increase children's suggestibility and the emergence of false memories is the investigator's use of focused rather than open-ended questions in an interview. In a lineup situation, the witness is often first interviewed to get a description of the perpetrator. Stress or increased emotional arousal experienced during retrieval of events could also increase children's suggestibility.

Children show marked developmental improvements in their ability to recognize faces (Davies, 1996). Flin, Markham and Davies (1989) asked children to briefly observe a photograph of a male face before compiling a Photofit from memory. A Photofit is carried out when a witness works with a police artist (Photofit operator) to construct a composite likeness of the suspect's face from their own memory. The Photofit is a program that consists of several hundred monochrome photographs of eyes, noses, mouths, chins and hairstyles. With help from the operator, the witness chooses a set of facial features and these are placed together in a special frame to create a facial picture. A study by Flin et al. (1989) involving 8-year olds, 11-year olds and adults showed that the accuracy of both the initial verbal description and the subsequent phantom image increased significantly with age. The accuracy of the verbal description produced by children of different ages was not significantly linked to the quality of the phantom image they produced, suggesting that verbal description and composite production may draw upon different skills.

Some studies suggest that children under 9 years of age are better than older children at recognizing exterior facial features (e.g. hair, face, shape) than interior features (e.g. eyes, ears, nose) of familiar

persons (Campbell, Walker, & Baron-Cohen, 1995). Similarly, Davies, Tarant and Flin (1989) found that when describing unfamiliar persons, younger children recalled fewer interior facial features than older children. Moreover, Pozzulo and Warren (2003) found that accuracy was significantly lower for youths than adults when they reported interior facial features (e.g. nose shape) versus exterior facial features (e.g. hair). The explanation for this result could be, according to the researchers, that children might focus on exterior features initially, which are more salient and, hence, more focused on.

In this context Pozzulo (2007) concluded that, although interior features are less likely to change and may be a unique clue in helping narrow down the suspect search, they still may not be accurately reported by children or youths. For example, exterior features may initially be more salient and, hence, focused on. With increasing age, interior facial features are more observed, encoded, and recalled, along with exterior facial features. Alternatively, interior features may be more difficult to describe, requiring a richer vocabulary (e.g. stating that she had a turned-up nose may be more accurate than stating that her nose was small). Furthermore, in order to describe interior features, one may need to consider relations between features (e.g. eyes may appear large on a small face) and be able to integrate relations, an ability that may emerge later in childhood (Carey & Diamond, 1977).

Face recognition studies suggest that children may encode faces with the use of a feature strategy that is different from that of the strategy used by adults who use a holistic strategy. Higher recognition accuracy for faces is found when participants use a holistic strategy, rather than a feature strategy (Wells & Hryciw, 1984). Feature strategy means that you concentrate on, for example, the nose or the mouth of the face to be remembered. The holistic strategy includes the entire face. A nose or a mouth seldom change, but when you concentrate on the entire face there could be

a change in hair color, for example, or facial hair. Some data from the face recognition literature suggest that children under 10 years of age are more likely to use a feature strategy to encode unfamiliar faces, whereas adults are more likely to use a holistic strategy (Carey & Diamond, 1977; Diamond & Carey, 1977). A feature strategy, where only a few details of the face are remembered, may help to explain the difference in identification accuracy for children and adults across lineups.

Pozzulo (2007) concluded that children will be more accurate with increasing age. "When presented with a lineup (identification task), we would expect 6-year-olds to be less accurate at identifying the culprit than 8-year-olds or adults. Moreover, we would expect children after 10 to 12 years of age to have an adult level of identification accuracy" (Pozzulo, 2007, p. 292). Pozzulo argued that this might be because they use the holistic strategy in their judgments.

Some studies have examined the ability of children to describe unfamiliar people. Children have been found to provide fewer person descriptors than adults. In one study, Davies, Tarrant and Flin (1989) asked younger (6- to 7-year-olds) and older children (10- to 11-year-olds) to describe a stranger with the use of a free recall format. Younger children recalled fewer items than older children. Dent and Stephenson (1979) found that few children did not provide any descriptions of the target at all (zero descriptors) when they used a free recall format. The instructions were as follows: "You have seen a film about a man in a white mac and a man with a car. I haven't seen the film so it's your job to tell me about it. Don't make anything up, just tell me what you actually saw in the film, and don't worry if you forget some things." (p. 43). In addition to free recall, the children were also tested with general questions and specific questions over a time of two months (5 sessions). They found that free report generated significantly fewer correct points than the other two conditions and the general

questions generated fewer correct points than specific questions. A more secure approach would be to compare child and adult witnesses in the same study, at least under the same instructions, to identify differences or similarities in their descriptions. In sum, children apparently recall fewer person descriptions than adults, but the accuracy of person descriptors varies by age of the witness and by type of descriptor (for a reveiw see Meissner, Sporer, & Schooler, 2007).

Some practical consequences of these results are that child witnesses tend to provide limited descriptions of moderate accuracy when it comes to face description, which should be of great concern to the police. The few descriptors that children do provide will often not be enough to narrow down the suspect search. In addition, it is unclear whether only a few descriptors will be a sufficient aid in foil (person who resembles the suspect) selection for a lineup identification task. Pozzulo, Dempsey, Crescini and Lemieux (2009) studied the relation between eyewitness recall and accuracy of identification in lineup identification in children and adults. They found no evidence that witnesses who made accurate lineup identification decisions recalled more information than witnesses who made inaccurate identifications. Neither did they find any evidence that witnesses who made accurate identifications were more likely to be accurate in their recall than witnesses who made inaccurate identifications. Schooler and Engstler-Schooler (1990) suggested that asking for a verbal description of the perpetrator may later interfere with the identification task because the verbal memory overshadows the visual memory. Memon and Rose (2002) examined this effect with children, but found no verbal overshadowing effects. Meissner, Sporer and Susa (2008) concluded in their meta-analysis that "there does appear to be a small, but significant, relationship between the description measures of accuracy, number of incorrect descriptors and congruence with that of subsequent identification accuracy" (p. 414). They also found certain conditions that could strengthen the

magnitude of this relationship. The use of face recognition versus eyewitness identification paradigms and the length of delays between relevant tasks were included in this.

Ellis and Flin (1990) attempted to determine whether children's face recognition abilities are affected by delay. Recognition accuracy by 7-year-olds was not affected by a 1-week delay. In contrast, recognition accuracy decreased for 10-year-olds with a 1-week delay between encoding and recognition, compared with no delay. Ellis and Flin suggested that younger children might only encode a few features to begin with, making them less susceptible to forgetting. A lot of research has tested the children the same day as the witness moment. In Study 2 and 3 in this dissertation, the children are tested after 1 week, since this delay or longer could be expected in criminal investigations, at least in Sweden, judging by the author's experience.

Carey, Diamond and Woods (1980) observed that overall performance in face encoding improved markedly between ages 6 and 10 and then remained at a fixed level or actually declined for several years, finally improving again by age 16. Diamond and Cary (1977), on the other hand, found that at the age of 10 years and until the age of 16 years, accuracy in recognition tended to remain constant, rather than decline. Researchers thus disagree as to whether a decline occurs and, if so, at which age. McGivern, Andersen, Byrd, Mutter and Reilly (2002) argued that from the start of puberty, at the average age of 11 years for girls and 12 years for boys, the reaction time for recognizing a face decreased over the next 2-3 years, but was stabilized at 15 years of age. A possible explanation of this shift is that at the age of puberty a wave of synaptic proliferation onset occurs in the frontal lobe which may lead to slower reaction time for making a correct decision (McGivern, Andersen, Byrd, Mutter, & Reilly, 2002).

Some research has been done about shy witnesses. Pozzulo, Coplan and Wilson (2005) found that shy witnesses recalled – or reported - fewer crime details. The researchers also manipulated the emotional arousal of the witness. With induced arousal, non-shy witnesses reported more accurate descriptions than shy witnesses. Pozzulo, Crescini, Lemieux and Tawfik (2007) found that shy participants reported higher levels of stress than non-shy participants, but nevertheless showed a comparable recall accuracy. Finally, Kleitman and Stankov (2007) found that shyness was related to a lower confidence level.

Characteristics of the self as related to witness capability

The self comprises our thoughts, beliefs and the understandings we have about who and what we are. How we view ourselves is shaped by society and the culture we grow up in. Western and eastern cultures have different attitudes and values about the self. In western cultures people tend to have a view of the self as independent, defining themselves by their internal thoughts, feelings and actions. People in Eastern cultures tend to entertain an interdependent view of the self, defining their self in terms of relationships they develop with other people. This dissertation however is confined to research conducted in Western cultures.

Two aspects of the self appear to be relevant in the present context, the self as a subject (the I-self) and as an object (the Me-self) (Harter, 2006). William James (1890) introduced the distinction between the I-self as the actor or knower, and the Me-self as the object of one's knowledge. Lewis and Brooks-Gunn (1979) defined this duality as the existential self and the categorical self.

Interaction with other people is fundamental for the establishment and development of the self. Talking with and observing other people give us an idea about how we are different from them and therefore unique. It gives us an understanding of our selves. Social comparison theory states that we learn about our abilities and attitudes by comparing ourselves to other people (harter, 2006).

It is not uncommon for children who experience severe and chronic sexual abuse by their parents to also have been subjected to other types of maltreatment, including verbal, physical and emotional abuse (Cicchetti, 2004; Harter, 1999). Gralinsky, Feshback, Powell and Derrington (1993, in Harter, 2006) observed that older maltreated children report fewer descriptions of more nuanced mood states and feelings than children with no known history of

abuse. Thus there is a growing body of evidence that the defensive processes that are mobilized by maltreated children interfere with one of the primary tasks of the I-self namely to promote an awareness of inner thoughts and feelings. Lack of self-awareness can also be expected to interfere with the ability to develop an autobiographical memory. One critical function of parenting is to assist the child in creating a narrative of the self, an autobiographical account that includes perceptions of self and others (Nelson, 2003; Snow, 1990). The parental practices that have been associated with child abuse represent precisely the kind of treatment that would lead children to develop unsecure attachments and a concept of self as unlovable and lacking in competence. It is often these children that become witnesses in the forensic process and perhaps sometimes the key witness. Thus it could be important to find out if the self in any way correlates with accuracy or confidence in lineup identification.

In examining self-development it is relevant to consider the antecedents of self-representations as well as their consequences. With regard to antecedents, the self is a cognitive as well as a social construction. As a result, the self develops over time as cognitive processes undergo normative-developmental change.

Self-perception

Most young children describe themselves as exemplary, that is "all good" typically providing a story of positive attributes and abilities. Along the developmental route, we gradually realize that we can posses both positive and negative attributes; however for most individuals the positivity bias continues to dominate. Low self-esteem is associated with a number of negative correlates such as depression and self-destructive, antisocial or aggressive behaviour (Harter, 1998). It seems reasonable to expect that children with negative perceptions of their own general capacities may be less confident as witnesses and question their own performance when making identifications in lineups.

In study 3 included in this thesis, we use Susan Harter's *Self-perception Profile for Children* (Harter, 1981) to explore how witnesses perceive themselves with respect to their confidence and accuracy in lineup identifications.

Self-doubt

People who mistrust their judgment should frequently find themselves asking or allowing others to make decisions for them, thereby generating evidence in support of their belief that others are more capable than they are. They approach important decisions as trials in which they are likely to find themselves in a trapped situation. Such individuals are likely to perceive decision making as an onerous activity. Prior to an important decision, they are inclined to be distraught as they vacillate between incompatible alternatives. Prone to hesitancy and vacillation, self-doubters may be less efficient and accomplish less than their more confident fellows, validating their disparaging self-evaluation still further (Mirels, Greblo, & Dean, 2002).

In study 3, we used the self-doubt scale by Mirels, Greblo and Dean (2002) to explore if self-doubt correlates significantly with confidence or accuracy. The Judgmental Self-Doubt Scale (JSDS) was developed as a self-report instrument designed to asses the extent to which a person believes that he or she is deficient in the ability to make accurate judgments or correct decisions.

Lineups

Lineups are used to obtain suspect identifications. As described below, they can be presented live, over video or by use of photographs. The suspect and fillers (persons who are good alternatives to the suspect, also called foils) are shown to the witness, who is expected to choose the suspect from the lineup, reject the lineup ("culprit not present") or go for the option "I don't remember". Of course, the police often have no way of knowing for sure whether they have arrested a guilty or innocent suspect which is the main reason for seeking lineup identification. Foil identifications are errors known to the police and which therefore can be disregarded. However, foil identifications jeopardize the witness, perhaps making his or her testimony about other crime details less believable (Wells et al., 1998). Of course, the police often have no way of knowing for sure whether they have arrested a guilty or innocent suspect and, if the witness then makes an identification, it could cause great consequences. Lineups can be carried out in different ways, which will be discussed in this section. First, lineup methods in general will be described, followed by a discussion of children's lineup performance.

Different lineup methods

There are different ways to carry out a lineup. The most common are visual lineups, which are conducted when the witnesses have seen the culprit. Other ways of encounter are by voice or smell. It is possible to perform a lineup in all three modalities, but the most common way to carry out a lineup is a visual lineup. Lineups based on voice and smell can be performed in various ways but will not be further discussed here.

Lineups can be conducted with live presentations of the suspect, together with persons acting as foils, or by means of video or photographs. The target (the suspect) can be present or absent in

the lineup. When the live version is used, the suspect and fillers are presented behind a one-way mirror. This way, the witness can see the members in the lineup, but not the reverse. If a video version is used, the lineup members are recorded and the film is shown to the witness. The film could also be shown in court. The photograph version is often less expensive and the quickest version to use, and also simple to use if there are difficulties for the witness to come to the police station.

There are three alternative ways to perform a lineup: *show-up*, *simultaneous* and *sequential* lineup. In a *show-up* only one person at a time is shown to the eyewitness who is then asked if this is the perpetrator in question. Usually, photographs are used for show-ups. This method is often used at the exact location where the crime occurred. "Show-ups can be considered suggestive in the sense that they convey to the eyewitness which person is the suspect" (Wells et al., 1998, p. 631).

The most common method to carry out a lineup (Wells et al., 2000), and the method that earlier was the most often used by the police in Sweden, is the *simultaneous method*. It is carried out by showing all the photographs or persons, live or recorded, at the same time. The witness has to choose one of them or reject the lineup as not containing the culprit. With this method, the witness has been argued to use a *relative judgment* where s/he first compares all the pictures with one another and then picks the photograph that is most similar in physical appearance to their memory of the culprit (Wells, 1993). Provided that the culprit is in the lineup, a relative strategy may work because the culprit will, most likely, look like himself/herself. However, it is possible that the culprit is not in the lineup, as when the police have arrested an innocent person. In this case, there is a risk that an innocent person is pointed out (Wells, 1993).

Much research now recommends the *sequential method*, where the police show one photograph at a time and the witness has to decide if the person is the culprit or not, prior to being allowed to view the next person. Lindsay and Wells (1985) developed this method to decrease false positives (foil identification) that is to decrease identifications of innocent suspects. Witnesses are not allowed to reexamine previously shown lineup members. Lindsay and Wells (1985) suggested that witnesses are likely to use an *absolute strategy* with sequential lineups implying that the witness compares each lineup member with his/her memory of the culprit and the lineup member will be identified as the culprit only if there is a match.

For these two types of lineups, simultaneous and sequential, Lindsay and Wells (1985) found the mean figures for incorrect identifications in target-absent lineups to be 43 percent in the simultaneous version and 17 percent in the sequential version (adult participants). A meta-analysis of 25 studies made by Stebly, Dysart, Fulero and Lindsay (2001) that compared simultaneous with sequential lineups showed that sequential lineups reduced the risk of false identifications in target-absent lineups by nearly 50%. Unfortunately, the sequential method was also associated with a slightly smaller proportion of correct identifications in target-present lineups. However, the authors recommended the sequential method. Lindsay, Lea, Nosworthy, Fulford, Hector, LeVan et al. (1991) showed that the sequential method was less sensitive to lineup biases such as when the suspect doesn't match the fillers well enough. Other researchers have suggested that when a lineup administrator is aware of the suspect's identity, a biasing effect occurs with the sequential method, but not with the simultaneous method (Phillips, McAuliff, Kovera, & Cutler, 1999). There is still a discussion as to which method should be recommended, since there are different advantages and disadvantages with each of the methods. Lindsay and Wells (1985) suggested that a six-person lineup could be broken up into "…two sets of three, three sets of

two or six individuals presented sequentially" (p. 559). Dillon, McAllister and Vernon (2009) tested this in a study using simultaneous, sequential and two types of hybrid methods. One hybrid contained two photographs at a time and the other hybrid contained three photographs at a time. The researchers reported, that "the results indicated that hybrid array sizes were as good as sequential and better than simultaneous at correct rejections. The simultaneous procedure was superior in correct identifications, although in most cases the differences were not significant" (p. 90). Their study was an attempt to stimulate more research with hybrid methods of lineups. There is some evidence that using more than one picture at a time might solve some problems with sequential lineups. Researchers (McAllister, Michel, Tarcza, Fitzmorris, & Nguyen, 2008) have referred to a lineup with subsets of lineup photographs larger than one as a hybrid procedure that has both simultaneous and sequential elements. They found that for target-present conditions, the grouped presentation procedure generated more correct identifications than the one-at-a time procedure. The percentage of correct identifications is normally decreased in sequential lineups compared with simultaneous lineups. It should be noted that research comparing simultaneous and sequential lineups has mostly been conducted with adult subjects and is therefore not necessarily possible to generalize to children.

Disputing the contention that sequential lineups elicit use of an absolute decision strategy, Ebbesen and Flowe (2002) argued that they rather led witnesses to adopt a more conservative response criterion, that is they induced a criterion shift. Gronlund (2004) conducted a study to compare the criterion shift and decision strategy explanations of the identification process. In contrast to the typical lineup involving faces, participants had to remember men's height that was encoded either in absolute (e.g. 6 feet) or relative (e.g. higher than) terms and subsequently presented in either simultaneous or sequential lineups. Memory for height was chosen because it allowed better control over encoding than is

possible for faces. The results showed that in sequential lineups performance was best when height had been presented in absolute terms, and vice versa with simultaneuous lineups, yielding evidence in support of the decisions strategy explanation. In a later study Gronlund (2005) collapsed the data from Gronlund (2004) over the various heights and obtained results suggesting that the sequential lineup advantage is due to the encoding of distinctive information, the retrieval of that information using recollection, and the greater likelihood of using recollection in a sequential lineup. He argued that recollection (remember) is used in sequential lineups and recognition (familiarity) in simultaneous lineups. In accordance with these results, Mäntylä (1997) found that memory for a distinctive face was more likely to result in a *remember* judgment than a *know* judgment recognition. Remember judgment is an event that is recognized when its occurrence brings to mind some specific experience in which the event was originally encoded. Alternatively, knowing judgment is an event recognized, not because of specific images or experiences, but because of feelings of familiarity that can be attributed to it (Mäntylä, 1997). These judgments indicate the contributions of recollection (remember) and familiarity (know). That is why it's easier to see only one person at a time, as with sequential lineups and contributes further explanation as to why sequential lineups are often better than simultaneous lineups (Grönlund, 2005).

Carlson, Gronlund and Clark (2008) showed that the poorer results that are often found with simultaneous lineups could be explained by the choice of fillers. If the suspect deviates from the fillers, s/he will be easier to identify. Their study demonstrated that this is not the case in sequential lineups, since only one person at a time is shown. The study also showed that there was a higher probability that the suspect would be identified when the suspect is somewhere at the end of the lineup. Carlson et al. (2008) suggested that there are two important things to pay attention to when putting together a lineup. One is the lineup's composition and the

other is the suspect's position in the lineup. When you conduct the lineup, there are other things to pay attention to as well. This is discussed below (pp. 30-32).

Unfortunately, the advantage of the sequential lineup does not hold for children, wherein the researchers have found that the simultaneous method is better (Pozzulo & Lindsay, 1998). In a meta-analysis, Pozzulo and Lindsay (1998) compared identification accuracy in target-absent lineups for children versus adults. They found that "compared to simultaneous lineups, the gap between children's (9-10 years) and adults' correct rejection rates widened, rather than decreased, with the use of sequential lineups. Children made fewer correct rejections and adults made more correct rejections with sequential lineup compared to simultaneous lineup" (p. 565). Pozzulo and Lindsay recommended the simultaneous lineup to be carried out with children.

Children in lineups

When a child has witnessed a crime, he or she may be asked to participate in a line-up. If the child makes a correct identification of the suspect, it strengthens the investigation. Unfortunately, in cases where the police have arrested an innocent suspect, children, even over 12 years of age, are more likely than adults to identify an innocent person (Pozzulo & Lindsay, 1998).

As discussed above in the context of the study by Pozzulo and Lindsay (1999), the lineup task itself may exert pressure on the witness to make an identification; that is to say, to select someone (Ceci, Ross, & Toglia, 1987). The pressure to select is further increased when the lineup is presented by an authority figure such as a police officer or experimenter (Pozzulo, 2007). Moreover, the fact that the authority figure is an adult explains why children are more susceptible than adults to the presenter's questions. Children may be more willing to please others than adults are, for instance

by providing the answer they think the adult wants (Pozzulo, 2007). Once a witness is asked if the target is among the photographs shown, a child may infer that the task is to select one of them. Children may presume that not selecting a lineup member is an undesirable response.

Thus, a target-absent lineup may elicit an incorrect response because children think they are expected to make an identification. The perceived pressure to pick someone may be lower for adults, or adults may be more able to resist such pressure. On the other hand, adults´ higher choosing rate with simultaneous compared with sequential presentations suggests that adults are not immune to the pressure to make an identification. If feeling pressured explains children's higher false-positive rates compared with adults, identification procedures should be geared towards reducing children's expectations to make an identification. Some researchers have used practice lineup trials in an attempt to decrease children's assumptions that they are expected to make an identification (Parker & Ryan, 1993; Pozzulo & Lindsay, 1999).

As noted above, it has been shown in the face recognition literature that recognition accuracy of unfamiliar faces increases with age. It is important for a witness to be able to identify the culprit (i.e. make a correct identification), but it is also important to be able to correctly reject a lineup when the culprit is not present (i.e., when an innocent suspect has been arrested). Not surprisingly, as correct identifications increase with age, false alarms have been found to decrease with age (Chance, Turner, & Goldstein, 1982; Flin, 1980). Shapiro and Penrod (1986) found, in a meta-analysis, that age yielded one of the largest effect sizes for false alarms.

Pozzulo and Lindsay (1999) sought to develop an identification procedure specifically geared toward child witnesses, called the *elimination* lineup with features derived from both the simultaneous and the sequential methods. The elimination method has, to the

author's knowledge, not yet been used in actual law enforcement and has only been tested with photograph lineups. Both *fast* and *slow* versions of elimination lineups have been applied. In the fast version, the administrator shows all photographs at the same time and the witness is asked to select the photograph from the lineup that looks most like their memory of the culprit (judgment 1) and then decide if that is the culprit (judgment 2). In the slow version, the administrator shows all the photographs at the same time and the witness is asked to eliminate lineup members one at a time by successively selecting the remaining lineup member who looks least like the culprit. This process continues until only one photograph remains (judgment 1). Afterwards, they proceed to judgment 2. One advantage with this procedure, according to Pozzulo and Lindsay (1999), is that if the witness has selected a known foil, it is not necessary to accomplish judgment 2. Then the witness can still be seen as trustworthy, according to Pozzulo and Lindsay. This is probably not the opinion held by investigators in Sweden.

Pozzulo and Lindsay thus proposed a two-judgment theory of identification accuracy in the elimination lineup. They postulated that witnesses first use a relative judgment, where s/he compares all the photographs with one another to narrow down the lineup members to one person who looks most like their memory of the culprit. Secondly, the witnesses are assumed to use an absolute judgment, comparing the remaining lineup member with his/her memory to decide whether the most similar person is, in fact, the culprit. With a target-present lineup, adults and children have been observed to generate similar rates of correct identification (Pozzulo & Lindsay, 1999). In contrast, with a target-absent lineup, children produce lower correct rejection rates than adults so an innocent lineup member may be selected, presumably because the children feel greater pressure than adults to make an identification. However, the elimination procedure has been shown to be effective for children at increasing the correct rejection rate in target-absent lineups (Pozzulo, Dempsey, & Clarke, 2010a; Pozzulo & Lindsay,

1999), while maintaining the correct identification rate compared with the simultaneous procedure. The results for correct rejections hold for children as small as 3 to 6 years old (Pozzulo, Dempsey, & Crescini, 2009). This pattern of identification rates, however, was not observed for adult witnesses (Pozzulo & Lindsay, 1999). The simultaneous and elimination procedures produced comparable correct identification and rejection rates for adult witnesses. Later research (Pozzulo, Dempsey, Corey, Girardi, Lawandi, & Aston, 2008) has reported that for adults elimination lineups gave the same result for false identification as sequential lineups whereas correct identifications decreased with elimination compared to sequential lineups for adults, but not for children. Children as small as 3-6 years old seem to be able to accurately identify a suspect in a lineup depending on what type of lineup that is used. When the suspect is not in the lineup there is a high risk that the children makes a false identification. This phenomenon decreases in older children probably because they feel less pressure to make an identification. In sum, the question which method that is the best for children is far from settled. Whereas earlier research generally found the simultaneous method to be the best option, more recent studies have found the elimination method to be a more promising alternative. An unsolved problem is that different methods seem to be preferable for children and adults whilst it is difficult to decide when a witness should be classified as child or adult.

Conditions that may affect witness reports: estimator, system and postdiction variables

A witness, an adult as well as a child, is affected by many variables related to the witnessing of an event. They are also affected afterwards, during the investigation period. This may have an impact on their accuracy as witnesses. Children are sometimes especially sensitive to these factors, which thus should be taken into account when determining whether a child is a reliable witness or not.

Estimator variables are factors that the criminal justice system exerts no control over; for example, the amount of time the witness was able to encode relevant information or the stress level of the witness at the time of the event. In contrast, *system* variables are variables that the justice system can control; for example, the characteristics of the lineup members, the lineup procedure and the interview technique applied (Wells, 1978). Cutler, Penrod and Martens (1987a, 1987b) examined the effects of 14 estimator and system variables and found that "identification accuracy was affected by both estimator and system variables including disguise of robber, weapon visibility, elaboration instructions and lineup instructions" (p. 233). When a witness's memory is strong regarding an event, then it's not likely to be influenced by a biased lineup. A lineup is biased if the filler does not match the suspect or the filler and the suspect are too similar. On the other hand, when a witness's memory is weaker, system variables have a stronger impact (Wells, Memon, & Penrod, 2006) and may influence the witness's accuracy in identifying a suspect or recalling an event. *Postdiction* variables refer to processes that correlate with the reliability of the identification of suspects such as the confidence that a witness feels for an identification or the speed with which a witness identifies a suspect from a lineup. Below follows a discussion of different estimator variables, such as cross-race identification, stress, weapon focus, exposure duration, disguise,

retention interval and witness intoxication, all features that have been shown to be important for the accuracy of a witness's memory of an experienced situation.

Estimator variables

As noted above, estimator variables are not under the control of the justice system, but they are important for our treatment of the witness. Estimator variables are important in order to understand when and why witnesses make errors. The effect of a system variable is sometimes dependent on the level of the estimator variables (Wells, Memon, & Penrod, 2006). As an example, to an intoxicated person in a dark place witnessing an armed robbery with a disguised culprit, it is much more difficult to identify the offender than a person witnessing for instance a bicycle theft in bright daylight.

Cross-race identification

Research has found that witnesses are less accurate when doing a cross-race, compared with an own-race, identification. Meissner and Brigham (2001) reported that there was a 1.56 times greater risk of a mistaken identification if the suspect was of another race than the witness. Meissner and Brigham explored the question of whether cross-race contact could reduce the effect. They found that such contact played only a small role in this matter. Pezdek, Blandon-Gitlin and Moore (2003) examined the cross-race effect with children in kindergarten, third grade and young adults. They found that the cross-race effect did not differ across age groups. In each age group, cross-race identification was less accurate than own-race identification.

Stress

One way of inducing stress in an experimental situation is to show videotaped crimes in violent, versus non-violent, versions. Deffenbacher, Bornstein, Penrod and McGorty (2004) published a

meta-analysis of stress effect studies. It was conducted on 27 tests of the effects of heightened stress on identification accuracy and 36 tests of the effect of stress on recall of crime-related details. They found that a high level of stress influenced both types of memories negatively. Morgan, Hazlett, Doran, Garrett, Hoyt, Thomas et al. (2004) illustrated eyewitness capabilities by examining 509 active-duty military personnel enrolled in a survival-school program. The participants experienced either a high- or low-stress interrogation with physical confrontation in the high-stress, and without physical confrontation, in the low-stress interrogations. The interrogations lasted for 40 minutes. All the participants were exposed to stress of uniform sleep and food deprivation for approximately 48 hours prior to being subjected to interrogation stress. After one day of recovery, the participants viewed either a live lineup by the simultaneous method, a photo spread presented with the simultaneous method or a sequential presentation of the photographs. The memory accuracy in the high-stress group was much lower overall than for the low-stress group, regardless of the testing method.

Weapon focus

Weapon focus refers to the visual attention eyewitnesses pay to a perpetrator's weapon during the course of a crime. It is expected that the attention directed by the eyewitness on the weapon will reduce his or her ability to later recall details about the perpetrator or to recognize the perpetrator. In a meta-analysis by Steblay (1992), where she reviewed 19 studies, the weapon-focus effect on identifications was statistically significant, but reflected a modest impairment; the effect on description accuracy was larger.

Davies, Smith and Blincoe (2008) examined if the weapon focus also occurs when children witness a crime. They tested 7, 8 and 9 years old children. "For one group, the array contained a syringe filled with red liquid (threat item) while for others this was replaced by a fountain pen (control) or mobile phone (novelty item)" (p. 19).

Children, of all ages, who saw the red liquid, showed significantly decreased recall in contrast to those who saw the pen or the mobile phone. Davies, Smith and Blincoe (2008) concluded that "weapon focus occurs in children and the current findings are consistent with a threat interpretation" (p. 19). Pickel, Narter, Jameson and Lenhardt (2008) agreed with this conclusion and speculated that it may occur because weapons are inconsistent with an activated schema. The researchers tested children 4-5 years old, 7-8 years old and adults. The participants watched a videotape in which a target individual who represented one of the two schema roles (either holding a weapon in the hand or a neutral object) was stealing some money. Witnesses, of all ages, described the target's physical appearance less accurately if the target held an object that was inconsistent, rather than consistent, with his schema role.

Exposure duration

Common sense tells us that the amount of time available for viewing a perpetrator is positively associated with the witness's ability to subsequently identify her or him. This was corroborated by Memon, Hope and Bull (2003), who examined the effect of exposure time with a realistic videotaped crime where the perpetrator was visible for 12 versus 45 seconds. Witnesses were tested with target-present and target-absent lineups. Both correct identification and correct rejection increased, when the perpetrator was shown for 45 compared with 12 seconds.

Disguise

When a culprit makes plans for a crime, these plans often include a disguise in the hope not to be recognized. Cutler, Penrod and Martens (1987b) investigated the significance of disguise by showing a videotaped robbery from a liquor store with a disguised or non-disguised robber. The robber was less accurately identified when he was disguised. In their meta-analysis, Shapiro and Penrod (1986) argued that non-transformed faces were accurately identified more often and falsely identified less often than faces that

were transformed between the initial viewing and the recognition phase. Sometimes when crimes have been impulsive the culprit perhaps grows a bear after the crime or changes his/her hair colour to mislead the witnesses.

Retention interval

Can we expect eyewitness identification accuracy to decline as the time between the crime and the identification test increases? Shapiro and Penrod (1986) also included retention interval in their meta-analysis. The outcome showed, not surprisingly, that longer retention intervals were associated with less correct identifications.

Witness intoxication

Dysart, Lindsay, McDonald and Wicke (2002) noted that the popular belief is that intoxicated witnesses are less accurate than sober witnesses. They examined the effect of alcohol using a showup. As noted above, in showups you only show one photograph at a time and the witness must decide if it is the culprit. The researchers found that in a target-present showup condition, the blood-alcohol level was not significantly related to correct identifications. In a target-absent showup, however, the blood-alcohol level was associated with a higher level of false identifications. Read, Yuille and Tollestrup (1992) examined identification accuracy one week after a staged event using a six-person lineup. The researchers found that alcohol intoxication was associated with a lower rate of correct identifications in target-present lineups when the level of emotional arousal was low during the event, whereas higher levels of emotional arousal appeared, instead, to minimize the negative impact of alcohol upon encoding and recall. In the target-absent lineup, the level of false identification was the same for intoxicated as for sober witnesses. Alcohol consumption also reduced the accuracy of recall for a variety of types of information, in particular, information about persons. This means that alcohol consumption could have a

negative influence on the witness, but high levels of emotional arousal can decrease the effects.

System variables

System variables mostly play their role after an event has been witnessed. At this time, the justice system has a possibility to control the situation.-One example of this would be by isolating the witnesses immediately after the event and to interview them in a proper way.

Interviewing eyewitnesses.

When the police investigate a crime, it is important to interview witnesses about the event. During the interview, the police may influence the witness, for example, misleading her/him if they are careless with instructions. The pros and cons of different methods for interrogation and interviews have been discussed for decades. If the interrogator performs the interview with focused questions, the choice of words could have a great influence on the witness's memory. For example, if the interrogator asks if the car smashed into or bumped into the car in connection with a car accident, it could influence the witness's memory of the speed that the car had (Loftus & Palmer, 1974).

The Cognitive Interview (CI) was initially developed by Geiselman and Fisher (Geiselman & et al., 1984; Geiselman, Fisher, MacKinnon, & Holland, 1985). In short, the following four steps are the most important in the CI: 1. Build rapport (where you personalize the interview), 2. Free recall of the event, 3. Open-ended questioning of an event; and 4. Closure (of the overview). CI is suitable for many types of interrogations and interviewees and works in most situations. An advantage with CI is that you put the witness mentally back at the scene of the crime. By asking them to tell the story from different perspectives, such as backwards/forwards, you could achieve more correct information without influencing the witness's memory.

Roberts, Lamb and Sternberg (2004) argued that there is some evidence that building rapport with open-ended questions can increase the accuracy of a child witness's report. It seems like children are able to be more accurate when they can decide themselves what to report, rather than answer focused questions. This issue is focused in the first study in this dissertation.

Some aspects of the lineup procedure ought to be controlled in order to prevent the witness from being biased; for example, lineup structure, fillers, the administrator and the lineup size. Wells et al. (1998) construed instructions to support the police to design a lineup in such a way that the witness would not be influenced in an inappropriate way. These and similar instructions are reviewed below.

Postdiction variables

Confidence

Confidence is perhaps the most researched postdiction variable (Wells, Memon, & Penrod, 2006). For example, the witness may be asked to judge their accuracy by answering how sure they are, percentagewise, of their identification. Confidence will be discussed below in a special section.

Response latency

Response latency is the time a witness requires to identify a suspect. It is not a genuine postdiction variable, since it is an aspect of the process that generates the identification response, but it will be treated as a postdiction variable here. Researchers debate if witnesses who make accurate identifications usually do so faster than those who make inaccurate identifications (Brewer, Caon, Todd, & Weber, 2006; Dunning & Perretta, 2002; Weber, Brewer, Wells, Semmler, & Keast, 2004). Dunning and Perretta (2002) found a 10-12 second rule to discriminate between accurate and inaccurate identifications. Weber, Brewer, Wells, Semmler and

Keast (2004) found that the time frame that proved most discriminating was highly variable across experiments, ranging from 5 seconds to 29 seconds. This is discussed below.

The self-reported decision process

A witness's accuracy could be influenced on the basis of the answer given to the question *how* they recognized the suspect. Dunning and Stern (1994) found that witnesses who made the comment "*I just recognized him*" or, "*I cannot explain why*" were more likely to be accurate than those who answered "*I compared the photos to each other to narrow the choices*". They concluded that witnesses who appeared to have used automatic recognition were more accurate than those who didn't.

Are witnesses' confidence in their judgments realistic?

Just as a person can be more or less certain that he or she is generous or curios, the person can be more or less certain that he or she has an accurate memory of a face. In this section, I will first discuss confidence in general, followed by confidence with respect to event-recall by adults, event-recall by children and then confidence in the context of lineups with adult and children.

In 1972, the U.S. Supreme Court accepted the five Biggers criteria to judge whether a witness is accurate or not (Wells & Murray, 1983). Prior to *Biggers*, the suggestiveness of the identification procedure was the standard criterion. "The *Neil vs. Biggers* case, however, shifted the emphasis from suggestiveness to accuracy" (Wells & Murray, 1983, p. 348). Thus, the case *Neil vs. Biggers* formed the basis of the five criteria to consider in determining accuracy in identification.

> "(a) The opportunity of the witness to view the criminal, at the time of the crime, (b) the witness's degree of attention, (c) the accuracy of the witness's prior description of the criminal, (d) the level of certainty demonstrated by the witness at the time of confrontation, (e) and the length of time between the crime and the confrontation" (Wells & Murray, 1983, p. 348)

The variables are thus: opportunity, attention, accuracy, certainty, and time. The Biggers criteria remain the primary variables used by

U.S. courts today for assessing the likelihood of mistaken identification (Bradfield & Wells, 2000). However, research has demonstrated problems with the Biggers criteria as indicators of the likely accuracy of identification (Wells & Murray, 1983). Here we will focus one of the most discussed variables; witness certainty, often referred to as "confident judgments".

Several variables can influence witness certainty or confidence. The condition of the eyewitness at the time of the identification task may influence the degree to which her or his self-reported confidence is a good indicator of accuracy. Eyewitnesses' expectations about their identification accuracy might be based on their personal experiences with remembering faces (Leippe & Eisenstadt, 2007). Also, their expectations about the difficulty of a memory task are potential accuracy cues. Further, if the witness enters the police station exhausted and deprived of sleep, there is a risk of providing an especially uninformative confidence statement, judging from a study by Blagrove and Akehurst (2000). Participating in a lineup task could be more anxiety-provoking for some witnesses than others. Bothwell, Brigham and Pigott (1987) found a higher confidence-accuracy correlation among witnesses higher (vs. lower) in neuroticism, a component of which is recurring, anticipatory anxiety. The moderating role of anxiety may involve tendencies of high-anxiety individuals to be less confident and more likely to be self-aware.

Loftus (1979) suggested that there are some circumstances, including receiving blatantly contradictory information, where people may be more confident about their wrong answers than they are about their correct responses. Somewhat despondently, she concluded that we should not take high confidence as an absolute guarantee of anything.

Brewer and Wells (2006) found that participants (16-60 years old, mean age =23,9, N=1200) with higher, compared with those with

lower, confidence made more correct identifications at target-present lineups and also fewer incorrect identifications at target-absent lineups. They also took less time to identify the suspect. From these results, Brewer and Wells argued that even if confidence is not perfectly correlated with correctness, it can provide an important hint. Brewer (2006) argued that confidence recorded directly after the identification response is indicative of the accuracy of the identification response, but that confidence judgment given at other times may not be, due to social influences. One reason why social influences could affect the level of confidence judgments is that witnesses may not consider their confidence until asked about it at some post-decision stage (Wells, Olson & Charman, 2003 in Brewer, 2006) A number of estimator variables could also be considered as influencing confidence (Bottoms, 2009).

Allwood, Ask and Granhag (2005) studied witness confidence in relation to event-memory. They investigated the realism in witnesses' confidence in the information they recalled when interviewed according to the cognitive interview, where the witness speaks freely from memory, or according to a structured interview, which employs focused questions. These researchers found that witnesses in both interview conditions displayed an unusually high level of accuracy (about 88% correct) and an unusually high level of confidence (about 91%). This seems to show that characteristics of the situation where the witness is asked to recall, rather than the type of interview, is decisive for the witness's general level of accuracy and confidence. Allwood, Granhag and Jonsson (2006) studied children's confidence in their event-memory. They tested four different confidence scales on children (11-12 years of age) and they found that the children showed overconfidence, independent of which scales were used.

In research with adult participants, the CA relationship, or the relation between accuracy and confidence, has not generally been

found to differ between simultaneous and sequential lineup conditions (Sporer, 1993; Wells & Lindsay, 1985). However, Weber and Brewer (2003) found better calibration (measures the relation between the level of confidence and accuracy) with a "multiple-face paradigm" (a simultaneous-like task where the participants make relative decisions about two faces) than with an "eyewitness paradigm" (a sequential-like task where participants make absolute decisions about single faces).

Even if many researchers maintain that confidence is not a useful cue to accuracy, others, for example Sauer, Brewer and Weber (2008,a), think it's informative and suggest that the best way is to ask for the confidence after each photograph has been shown. They argue that the witnesses will report higher confidence in a face they have seen earlier. Brewer and Day (2005) found a pronounced overconfidence in children and they argued that children's confidence ratings are not a good indicator of their accuracy in lineups. They found that the younger children (8-10 years old) were more overconfident than adolescents (14-17 years old). The younger children were also more impulsive in their identifications.

It has been a problem for the police and the courts to judge if witnesses are trustworthy or not. Courts have considered the witness's confidence to be a fairly reliable indicator of the accuracy of their testimony. According to Wells et al. (1998), the jury and the judges value a witness higher if he or she shows a high confidence in his/her testimony. In some cases, the judge has chosen to acquit the suspect since the witness was not 100 percent sure of their identification. Psychological research has generally pointed to a somewhat weak confidence-accuracy (CA) relationship for eyewitness identification. In earlier research, the point bi-serial correlation for the confidence-accuracy relationship for adults was typically reported to be between zero and .3 (Bothwell, Deffenbacher, & Brigham, 1987; Cutler, Penrod, & Martens, 1987b; Wells & Murray, 1983). When the analysis is restricted only to

witnesses who actually choose someone from the lineup, the CA correlation tends to be about .40 (Sporer, Penrod, Read, & Cutler, 1995). In Lindsay, Read and Sharma (1998), the CA correlation has been reported to be a bit higher (.50-.55). This was when the participants were instructed, before the video, that they were expected to identify a person from the video afterwards.

The confidence-accuracy (CA) correlation may not be the most informative measure of the nature of the relationship between these variables. If the procedure *calibration* is used, several researchers have argued that a richer perspective on the confidence-accuracy relationship in the eyewitness identification domain is obtained (Brewer & Day, 2005; Juslin, Olsson, & Winman, 1996; Keren, 1991). A calibration index (CI) can be computed which is the average (across witnesses) squared discrepancy for each witness between the confidence level and the actual proportion of witnesses who were correct in the witness's confidence group when the witnesses are grouped according to their confidence level. Calibration is typically assessed in four ways: *calibration curves*, *the calibration statistic*, *the over/under confidence statistic (O/U)* and *slope. Calibration curves* are created by plotting the proportion of accurate decisions for each level (or range, for a continuous scale) of confidence judgments against the mean confidence for that level or range. Perfect calibration is found if the percentage correct decisions in each group equal the group's confidence level. For example, if the condition has an accuracy level of 70% and an assigned confidence of 70% to each unit, then the group of participants has achieved perfect calibration, but shows no discrimination, meaning that is fails to identify the target better than chance (Keren, 1991). The *calibration statistic* is a measure of deviation from perfect calibration, ranging from 0 (perfect calibration) to 1 (worst possible calibration). It is computed as the weighted mean of the squared difference between confidence and the proportion of correct identifications at each confidence level. *Over/underconfidence* is a gross measure of the participant's

tendency to respond, on average, with more or less confidence than the accuracy of their decisions warrants. It ranges from -1 (complete underconfidence) to +1 (complete overconfidence) and is calculated as the difference between mean confidence and mean accuracy. In order to measure the participant's capacity to discriminate between right and wrong answers, *slope* is used by calculating the mean confidence of correct answers minus the mean confidence of incorrect answers. More details are given by Yates (1994).

Alternative methods to measure the probability of correct recall

Since research has shown that confidence is far from a perfect indicator of accurate identification, alternative indicators have been evaluated, two of which are briefly accounted for in the following: identification latency and the P300 response.

Identification latency

Research has shown that witnesses often experience a so called "pop-out" effect, which means that when the witness correctly identifies a suspect in a lineup, it occurs at a rapid pace and is accomplished by automatic processes to a great extent (Dunning & Perretta, 2002). The automatic process could be explained by the fact that the target is compared with the image in memory (i.e. a correct match). The large number of features in common allows for a very fast decision to be made. In contrast, a lineup foil (i.e. innocent filler) will not have as many features in common with the image in memory and will, therefore, be matched more slowly, that is when the witness does not recognize a face, no pop-out effect is found. In a study that used simultaneous lineups, Dunning and Perretta (2002) found that adult witnesses who took a shorter time to make identifications tended to be more correct than witnesses who took a longer time. The researchers suggested that "shorter time" means about 10-12 seconds. They showed that within this time limit the witnesses were 90 % correct. They analyzed accurate and inaccurate witnesses in both target-present and target-absent lineups.

Later studies have shown that the time limit depends on how many photographs there are in the lineup and on the age of the witness (Brewer, Caon, Todd, & Weber, 2006; Weber, Brewer, Wells, Semmler, & Keast, 2004). Weber, Brewer, Wells, Semmler and Keast (2004) found that the time frame that proved most

discriminating was highly variable across experiments, ranging from 5 seconds to 29 seconds. Ross, Benton, McDonnell, Metzger and Silver (2007) showed that there is no "pop-out" effect if the foils in the lineup look the same.

Sauer, Brewer and Wells (2008,b) examined whether eyewitness identification latencies for sequential lineup decisions indicate an optimum time boundary that reliably discriminates accurate from inaccurate decisions. The researchers were unable to find any results that replicated the results in the study by Dunning and Perretta (2002) with simultaneous lineup. This suggests that automatic recognition processes influence the identification more in simultaneous lineups than in sequential lineups.

The P300 response

Lefebvre et al. (2007) performed a study that measured witnesses' event-related potentials (ERPs) when they were tested in a lineup. The researchers used three different delays between the video and the lineup: no delay, one-hour delay and one-week delay. They used both target-present and target-absent lineups. The study gave significant support for their hypothesis that there would be a P300 response at a correct identification of the suspect. This support was strong over all three conditions. Even if the participant's correctness was lower after a one-week delay, the researchers always found the P300 response when the witness was correct and not when they were incorrect. They also found that in target-absent lineups, the P300 response was weaker or was not shown at all.

Lefebvre, Marchand, Smith and Connolly (2009) expanded their research by investigating ERP patterns when participants either responded truthfully or actively tried to conceal their knowledge of the culprit. They found that in correct identifications there were 100% P300 responses and in the deception condition it was 90%. In this study, there was only a delay of 2-3 minutes between the video and the corresponding lineup. The participants performed a

lineup with a truthful (correct) identification first and, directly after that, a deception lineup. Also, a recent study by Meijer, Smulders, Merckelbach and Wolf (2007) found that concealed recognition of photographs of salient familiar faces could be detected at a high level of accuracy (92%).

These are interesting results that merit more research and, even if this dissertation has not investigated deception in the lineup situation, it could be a problem in real life and deserves more focus. The ERP method could also be useful when a witness is uncertain of his/her identification, but responds in other ways, such as sweating or with rapid breathing. The ERP method could be an alternative way to measure witness accuracy, but it is currently too complicated to use in a police station. More research in this area is certainly warranted.

Current US and Swedish recommendations on how to conduct a lineup

It is important that a lineup is designed in a proper way since a biased lineup could influence the witness in a negative direction. Some of the different elements will be discussed below. Both the American and the Swedish instructions are discussed, since they differ in some ways. The Swedish instructions are tested in study 2.

The American Psychology/Law Society and Division 41 of the American Psychological Association, in 1996, took the initiative to review the research literature with the purpose to create a new guideline on how to conduct lineups. This resulted in the recommendation that a double-blind line-up should be recommended. This meant that the administrator is unaware of who the suspect is. The witness should be informed that the suspect's presence in the lineup is uncertain (Wells et al., 1998). The fillers should be picked out by the help of the verbal descriptions from the witness and the witness confidence should also be asked for by the interrogator. The lineup procedure should be video recorded.

The instructions issued by the Swedish National Police Board (RPS, 2005), in most parts, follow the recommendations given by Wells et al. (1998). According to RPS, the witness should be able to see all the photographs in the lineup once, one at a time, and all photographs should be shown a second time in the same way, even if there has been an identification. The Swedish instructions also recommend that the witness should have the opportunity to see each photo as long as he or she wants. The Swedish police have chosen these instructions because of the risk that the identification will be questioned by the court if the witness hasn't seen all of the photographs. The police also argues that the witness will feel more secure if they know that they have seen all the photographs (RPS, 2005). The lineup should be carried out in a calm manner without

any hurry and the suspect should be able to choose his/her place in the line-up (RPS, 2005).

A brief description of what you should consider when assembling a lineup follows, described according to the rules in Wells et al. (1998) and by the Swedish National Police Board (RPS, 2005). The description below is given in the order that lineups should be carried out. Therefore, rule 3 comes before rule 1 and 2.

Witness description

For the best results, the witness should be asked for a description of the culprit as soon as possible, before his or her memory is influenced by possible disturbing factors. The lineup should be put together after the witness's description of the culprit. If the suspect differs too much from the description, the lineup must follow the suspect's appearance.

Fillers

According to rule 3 in Wells et al. (1998, p. 630) "The suspect should not stand out in the lineup or photo spread as being different from the distractors based on the eyewitness's previous description of the culprit or based on the other factors that would draw extra attention to the suspect". The presence of features that make the suspect stand out from the distractors confounds the police's possibility to conclude that the identification of the suspect was due to true recognition or to some form of suggestion, demand or interference.

To test the quality of the lineup, it is recommended that the lineup is tested with some people who have no knowledge of the case, a "mock witness". "Mock witnesses are people who have never seen the culprit, but are given the eyewitness's verbal description of the culprit, shown a picture of the lineup or photo spread, and asked to select the person they think is the suspect in the case" (Wells, et al., 1998, p. 631). If the mock witness is able to identify the suspect

through the use of this procedure, one might ask if the fillers in the lineup are correctly chosen. An easy way to do this is to prepare a video lineup and show it in another police district.

The administrator

Rule 1 in Wells et al. (1998, p. 627) emphasizes that "The person who conducts the lineup or photo spread should not be aware of which member of the lineup or photo spread is the suspect". The instructions for the Swedish police recommend the same. The reason for this recommendation is that there is a great risk that the administrator may influence the witness to choose the suspect.

Instruction to the witness

Regarding how witnesses should be instructed, the first part of rule 2 in Wells et al. (1998, p. 629) notes that "Eyewitnesses should be told explicitly that the person in question might not be in the lineup or photo spread and, therefore, should not feel that they must make an identification. They should also be told that the person administering the lineup does not know which person is the suspect in the case". The Swedish police include only the first part of this rule in their recommendations.

The first part of rule 2 is based on research that has concluded that eyewitnesses are less likely to identify an innocent suspect when they are warned that the actual culprit might not be present in the lineup (research reviewed in Wells et al., 1998). The second part is related to the first one. "The person who administers the lineup should not only be blind as to which person in the lineup is the suspect, but should also be *perceived* (by the witness) to be blind as to which person is the suspect. The rational for this is simply to prevent eyewitness from looking to the lineup administrator for cues as to which person to select or for cues as to whether the person they selected is the 'right person' " (Wells et al., 1998, p. 630).

Obtaining confidence statements

Rule 4 in Wells et al. (1998, p. 635) states that "A clear statement should be taken from the eyewitness at the time of the identification and prior to any feedback as to his or her confidence that the identified person is the actual culprit". RPS follows this rule without any exceptions.

Purpose of the thesis

The general purpose of this dissertation is to increase our understanding of the accuracy of children's memory recall and of the realism in their confidence judgments of their memory recall in forensic settings. This goes for both event (Study 1) and face recognition (Study 2 and 3).

Study 1 takes a closer look at children's memory ability when giving a free recall of an event and when they answer to focused questions about the same event. The purpose was to see how much 8-9 years old children and 12-13 year~~s~~ old children could remember about a filmed event and to study the realism in their confidence in their answers compared to adults.

Study 2 concerns 10-11 years old children and adults' accuracy in identifying suspects in sequential and elimination lineups. Sequential lineups were used, since it is applied in Sweden with children (as well as with adults). Elimination lineups were used for comparison since previous research has found this method to be advantageous for children. Both accuracy and confidence was studied. To my knowledge, the realism in children's confidence judgments in elimination lineups has not been studied before.

Study 3 investigated if self-perception and self-doubt correlate with accuracy and/or confidence in both sequential and elimination lineups.

Overview of the empirical studies

Study I

Aims

Study 1 investigated the correctness in the memory recall and the realism in 8-9 years and 12-13 years old children and adults' confidence in their memory performance of a witnessed event. Moreover, we investigated the relation between the realism in the witnesses' confidence in the correctness of their recall, and the form under which the recall took place, in this case, either as free recall, or as responses to focused forced-choice questions.

Method

In Experiment 1 the participants were 62 children, 31 8-9 year-olds, 31 12-13 year- olds and 32 adults. The adults were undergraduate students.

The stimulus material was a 3 minutes and 50 seconds long video of a staged event, in which a man is looking for his lost dog. Thirty-nine forced-choice focused questions were used. The questions were about the content of the film and each question had two answers to choose from.

The experiment comprised three sessions. In *session 1* the video was shown and in *session 2*, one week later, each child was interviewed individually. After giving a free recall the children answered the questionnaire with focused questions. Between session 2 and 3, the interviews were transcribed and both the interview questions and the focused questions were prepared for the confidence judgements. This took place in session 3 one week later. In s*ession 3* the participants assessed their confidence in their interview statements and in their answers to the focused questions.

In Experiment 2 participants were 95 children, in the same ages as in Experiment 1, and 38 adults. The stimulus material was a 3 minutes and 50 seconds long video of a staged event, a woman being kidnapped by three men in a car. Forty-four focused questions about the appearance of the people in the video, such as clothes, hair colour, as well as the surroundings of the bus stop where the event took place were used. The same three sessions were conducted as in Experiment 1.

Results

Experiment 1 showed that in the free recall response condition the adults made significantly more statements than both child groups. There were no differences between the child groups. Correctness was higher for free recall than for focused questions in all age groups. Participants were more confident for free recall than for focused questions, with a main effect of age group. The older children were more confident than both younger children and adults who did not differ between themselves. An analysis of over-/underconfidence showed that older children were more overconfident than both younger children and adults and again the younger children and adults did not differ. An interaction was found between response format and age group, showing a significant difference for younger children and format of questions. For free recall the younger children showed close to perfect realism and in focused questions the adults were close to perfect realism. The older children were overconfident in both formats.

Experiment 2 showed a significant difference between age groups for completeness in that the number of statements increased with age for free recall. Overall, there was a higher percentage of correct descriptors for free recall than for focused questions. Also in experiment 2 there was a significant interaction between age group and response format: significant differences were found between age groups for free recall – 12-13 year-olds were less accurate than

both the 8-9 year-olds and the adults - but not for the focused questions. The participants were more confident for free recall than focused questions, and they were also more overconfident for focused questions. An exception is the 8-9 year-olds who showed neither over- nor underconfidence in the free recall condition.

Discussion

This study used two response formats, free recall and focused questions. Two different videos, one in each experiment, planned to differ in complexity, were used. The result showed that the response format affected the level of overconfidence. In general the hypothesis predicting format differences in the degree of overconfidence was quite well supported by the results. The result showed age differences for the two response formats. For the free recall responses, the 8-9-year-old children showed perfect realism in terms of the over/underconfidence measure whereas the other two groups showed overconfidence. Since children's confidence in their judgment is sometimes mistrusted, this result is noteworthy.

In the group with younger children there were more participants who only provided correct recall statements in free recall than in the other groups. This could indicate that the youngest children were more cautious in their approach to the free recall task than the other two groups. This suggests that the children are capable of accurate reporting when they are allowed to choose what to report.

All the age groups showed relatively poor realism in their confidence judgments on the focused questions. The hypothesis expecting age differences for focused question received only weak support. The adults in the present study showed a lower percent correct item compared with previous studies using the same video and approximately the same questions as in experiment 2. We have no explanation for this result.

Study II

Aims

Since the police in Sweden follow instructions for lineups that do not completely adhere to the recommendations from research we wanted to test the usefulness of the model recommended by the Swedish police. In experiment 1 we followed the Swedish instruction (RPS, 2005) applying a sequential lineup but modified it slightly by finishing a lineup session when an identification was made. Children have been shown to make more identification errors in sequential than in elimination lineups (Parker and Ryan, 1993). Experiment 2 used the elimination method where all the photographs are shown at the same time. Then the witness eliminates one photograph at a time that s/he judges not portrays the culprit. When one photograph remains the witness has to decide if it is the culprit or not. The sequential and elimination lineups were compared in terms of number of correct and false identifications and rejections and the participants' confidence in their responses.

Method

The participants were 481 10-11 years old children and 120 adults as a comparison group. Half the group of children and half of the adults were shown a target-present lineup and the other half a target-absent lineup. They participated in one lineup with a culprit and one with a bystander, either a boy or a girl. Half of the children were asked to identify the girl and half of them the boy. The stimulus material was a two and a half minutes long video that shows a store robbery.

At the first session the child participants were shown the videotape in groups of 15-20 in a classroom. One week later, the participants were asked to identify the culprit and one bystander among the photographs in a lineup. After the lineup, they were asked to judge their confidence in the correctness of their lineup judgment. This

session was carried out individually. The procedure for adults was similar to the children's with the exception that the children only identified the girl bystander. The adults did not participate in Experiment 2 that was performed in the same way as Experiment 1. A modified sequential lineup and an elimination lineup was conducted in Experiment 1 and 2, respectively, both including target present as well as target absent conditions.

Results

The frequencies of correct identifications in Experiment 1 showed that the adults performed better than the children only in the culprit target-present condition. When the target was present both adults and children performed better than chance for the culprit and boy bystander conditions but not different from chance in the remaining conditions. With the target absent the adults performed no better than chance in any condition. With respect to confidence there were small differences between conditions and these couldn't be explained by age. Both adults and children were overconfident.

In Experiment 2 the children attained an increased percentage of correct identifications and a decreased percentage of false identifications compared with the results in Experiment 1. In the culprit and boy bystander target-present lineup, but not in the target-absent lineup, they performed better than chance. Their confidence levels for correct identifications were higher for both the culprit and boy bystander conditions and they were overconfident also in Experiment 2.

Discussion

Pozzulo (2007) suggests that we can expect 10-11-year-old children to be comparable with adults in a witness situation, a contention that agrees with the results in this study. Not many calculations showed significant values for age differences in Experiment 1. The

frequencies of correct and false identifications suggest that the elimination method could be advantageous for children. The children were also less overconfident with the elimination method. More research, however, is needed since the results showed that the children performed by chance in more conditions in lineups conducted according to the elimination method compared with the modified sequential method.

The elimination method was developed by Pozzulo and Lindsay (1999) to increase correct identifications and decrease false identifications. The police do not so far, to our knowledge, use the method. The method needs to be tested with longer delays than one week between the crime and the identification since one week is a short time in the investigation procedure. A problem is that the elimination method appears not to be the most suitable for adults (Pozzulo, et al., 2008; Pozzulo & Lindsay, 1999) and it is not easy to know when the witness should be treated as a child or an adult in this context. The criminal justice system requires more information to know when it is suitable to use a specific identification procedure modified according to the age of the witness.

Study III

Aims

Much research effort has been devoted to find out which lineup method is the best for children, especially to decrease false identifications. Characteristics of the witness such as anxiety proneness or self-image may influence a witness's performance. This study aimed to explore if self-doubt and self-perception are variables that may affect children's identification performance.

Method

Participants were 481 children aged 10-12 years, and 120 adults. They participated in lineups with photographs, either in a

sequential lineup (Experiment 1) showing one photograph at a time, or in an elimination lineup (Experiment 2). The long version of the elimination procedure was used. In the long version all the photographs are shown at the same time, and the participant has to eliminate one photograph at a time. When one photograph remains, the participants have to make a decision if it portrays the culprit or not. The stimulus material was a two and a half minutes long video that shows a store robbery with a culprit and one boy and one gird bystander. Self-doubt was tested with *The Judgmental Self-Doubt Scale* (Mirels, Greblo, & Dean, 2002*)* and self-perception with the *Perceived Competence Scale for Children* (Harter, 1981). The adults were only shown the culprit and the boy bystander lineup and did not answer the Perceived Competence Scale.

Each experiment consisted of two separate sessions. At session 1 the participants were shown the videotape in groups of 15-20 in a classroom. After that the children drew a picture on the backside of the questionnaire and then filled in the questionnaire. In session 2, one week later, the participants were instructed to identify some people from the film on photographs, and were informed that it wasn't sure that any of the persons were among the photographs. The photographs either included (target present) or excluded (target absent) the culprit, the boy bystander and the girl bystander. After the identification the children were asked to judge their confidence in the correctness of their lineup identification response. In this session the children participated individually.

Results

Children. In the culprit-present lineup, there was a positive correlation between accuracy and confidence, high confidence being associated with high accuracy. In both the boy and girl bystander absent lineups the relationship between accuracy and confidence was the reverse, that is high confidence was associated with low levels of accuracy. Neither self-doubt nor self-perception was associated with accuracy or confidence.

Adults. In the culprit and boy bystander present lineups, there were significant associations between accuracy and confidence and a similar association was found in the culprit absent lineup. Finally, in the culprit present lineup self-doubt was significantly associated with confidence, that is to say that high levels of self-doubt were associated with low confidence levels.

Discussion

The most consistent finding in the study was the negative correlations between accuracy and confidence in target-absent lineups. This was found in both experiments with boy and girl bystander lineups. This is compromising for the judicial system since the court puts more trust in a witness that is 100 percent sure than a witness that is, for instance, 60 percent sure. It was also found that self-doubt and self-perception could affect accuracy in target-absent lineups with the elimination method but not with the sequential method. A possible explanation for this difference is that children are more secure and spontaneous when they see all the photographs at the same time (relative judgment) with the elimination method but not with the sequential method where they see the photographs only one at a time (absolute judgment). Results in previous research suggest that the elimination method is favourable for children but it should be noted that this method generated most of the significant correlations showing high levels of confidence to be associated with low levels of accuracy. A conclusion in this study is that especially in target-absent lineups, children who have a strong faith in themselves may not be reliable witnesses.

General discussion

The police are investigating a large number of crimes each year. In many of these, one or more eyewitnesses are involved and the police therefore often perform lineups to identify an offender. Much research points to the fact that many eyewitnesses make mistakes, both adults and children. Sometimes they identify an innocent person, or are simply unable to identify the offender. Lineup administrators also sometimes make mistakes in the sense that they use procedures that increase the likelihood of eyewitness error. Eyewitness memory research has provided a basis for many useful guidelines regarding the conduct of identification methods. However, the police in several countries make up their own instructions, not always in line with current research. These instructions may suite their own work or sometimes follow the demands of defense lawyers.

When a child has been witness to a crime it could be valuable for the police to interview them about the event. Nowadays the police normally, at least in Sweden, use the cognitive interview (CI) technique (Geiselman & et al., 1984). The CI starts after the presentation with a free recall from the witness, of the events, which is followed up by more detailed questions. Study 1 found that this is suitable for children from at least 8-9 years of age. The children didn't produce as many descriptors as the adults but mostly the descriptors were correct. Study 1 furthermore found that it seems easier for children to give an account of the witnessed event when they could choose themselves what to say about the event. A further benefit of an interview is that the child's recount of a witnessed event can lead the police to the conclusion that the child may be able to identify a suspect in a lineup.

If the police have a hypothesis about who the offender is, they could perform a lineup with an eyewitness to strengthen the evidence against the suspect. Sometimes there is no technical

evidence available and then to perform a lineup is the only way to advance and strengthen the investigation. Even if evidence obtained from an eyewitness is only a part of the case it can be critical for a convicting sentence (Cutler & Penrod, 1995; Wright, 2007) or be of use in the course of the investigation. In Sweden the court is not allowed to judge merely on eyewitness evidence. There must be technical evidence as well.

According to Pozzulo, Crescini, Lemieux and Tawfik (2007) children become more accurate witnesses with increasing age. Moreover, they suggested that we should expect 10- to 12-year-olds to have reached an adult level of identification accuracy, a contention that comports with our results in Study 2 and 3 where the children were 10-11 years old. It was only in the culprit target-present condition that adults performed better than children whereas there were no significant differences between age groups in the other three conditions. The results in Study 1 also indicate that even 8 years old witnesses could be as accurate as adults.

Interviewing children

With children more issues are at hand. For example, their cognitive developmental level has to be taken into account, which could be a problem for the investigator even if children can perform as well as adults when interviewed as witnesses. In Study 1 in this dissertation children aged around 8 years did not recall the same amount of information as the adults but the information they provided was mostly correct. For the older children, 12-13 years old, Study 1 showed that they fill in with information that is incorrect but they are still sure that all their information is reliable. The adults fill in with even more unreliable facts, which makes it difficult for the investigator to sort out reliable from unreliable reports. In Study 1 the young children didn't report many descriptors, a finding that agrees with previous research (Davies, Tarrant, & Flin, 1989; Dent & Stephenson, 1979). In study 1 there was a difference in completeness – the total number of statements

recalled - between experiments 1 and 2. There were no age difference between the children in experiment 1 but that occurred in experiment 2 where the 8-9 year-olds made fewer statements than the 12-13 year-olds. The film in experiment 2 showed more details and was more violent than in experiment 1, which may explain the age differences.

In sum, children could provide useful information as witnesses but it is important to separate between children's capacity to report an event and to recognize a person since different mechanisms probably control their performance in the different tasks.

Lineups

In Study 2, experiment 1, we tested children and adults with a sequential lineup procedure that was conducted according to the Swedish National Police Board's (RPS, 2005) instructions but modified in such a way that we stopped after an identification had been done while the police instruction says that you should show all the photographs a second time. Previous research has shown that children often do more multiple identifications if you show all the photographs after an identification has been done (Lindsay, Craigh, Lee, Pozzulo, Rombaugh and Smyth, reviewed in Parker & Myers, 2001). Earlier research (Duckworth & Kreiner, 2009; Lindsay, Lea, & Fulford, 1991) also recommends that the witness should not be allowed to see the lineup a second time. In experiment 2 we compared the elimination method with a modified sequential method. In both experiments 1 and 2 we used a one week delay between event and identification since that could be a normal, albeit somewhat short, delay before identification.

Modified sequential lineup

Parker and Ryan (1993) found that 83% of the children and 58% of the adults made false identifications when they were shown the photographs only once in sequential lineups. Study 2 where a modified sequential lineup was used – all the photographs are

shown twice in a sequential manner and the witness is instructed to identify a suspect, if any, on the second display - showed a decreased percentage of false identifications for both adults and children compared to Parker and Ryan's results. The difference for adults was small but for children the difference was 24%. The two studies were not performed in exactly the same way and thus the different results should be interpreted with caution. In Parker and Ryan's study the lineup was performed on the same day as the stimuli were presented whereas in our study one week passed between the stimuli and the lineup, which is more likely to happen in real life. Even with a one week delay the result was better than in Parker and Ryan's study (1993) especially for the children. This result raises the question whether it would be an advantage for the children to see all the photographs once before the identification decision. For example the pressure may decrease a little when they are able to see the photographs first knowing what will be expected from them. Earlier researchers have recommended that the witness should not be able to see the photographs a second time, and have recommended the simultaneous method to be better for children. It remains a problem, however, to decide when the witness should be classified as an adult or a child. The results in Study 2 point in the direction that seeing the photographs twice yields about the same percentage of false identifications as with the usual sequential method whereas a decrease in false identifications is found for children. Thus it should be possible to use the same lineup for both children and adults, which is to prefer for the investigator and judge involved. A remaining problem, however, is that the adults only performed by chance and the children even worse than chance. Thus, the pros and cons of the sequential lineup and the modified sequential lineup have to be investigated further with adults and children participating in the same study.

Elimination lineup

In Study 2, experiment 2, we tested children in elimination lineups, again with a one-week delay. A number of suggestive, although not

significant, differences emerged. In the culprit target-present lineup, the children performed better than with sequential lineups, but not better than the adults in experiment 1. When the target (the boy bystander) was in the same age as the child, the result for the elimination lineup showed that the children were even more correct than the adults in sequential lineups in experiment 1. In target-absent lineups the children in elimination lineups were not far from the adult results in sequential lineups both in the culprit and for the boy bystander conditions. Since all of these results are referring to non-significant differences between frequencies they can only be seen as suggestive indications that warrant further research.

Girl bystander

No adults performed any lineup with the girl bystander. The result for the girl bystander, in both experiments, was much worse than with the culprit and the boy bystander, in terms of accuracy. There is not any clear explanation for this result. It could have been that the lineup was biased in the sense that the photographs were too much alike. However, after testing the three lineups on 174 children we could conclude that the children judged all three lineup photographs with nearly the same score, which shows that they didn't think that the fillers in the girl bystander lineup was too alike. Another possibility is that the result could be due to a weapon focus effect since the girl stands just in front of the culprit. Previous research (Davies, Smith, & Blincoe, 2008) has shown a weapon focus effect among children. More research has to be done to explain this result.

Instructions to children in lineups

When lineups are carried out with children, it is probably not enough to let them know that it is not sure that the culprit is in the lineup, since children often feel obliged to make an identification. It seems important though, to inform the children about the consequences if they make a false identification. It could also be a

good idea to instruct them to take good time to think before they make an identification decision since children have been found to make identifications impulsively (Ceci & Bruck, 1993). The possible influence of spontaneity on a thoughtful identification decision is not tested in this dissertation but should be important to look further on. It seems to be a realistic expectation that, if spontaneity could be controlled, the children's no better than chance results in target-absent conditions in elimination lineups and worse than chance results in modified sequential lineups, could be improved.

Is there a best lineup method for children?

Comparing the results from Experiment 1 and 2 in Study 2 in this dissertation it seems reasonable to conclude that, when children are witnesses, the elimination lineup should be conducted rather than a modified sequential method. It is true that significant results to support this conclusion were obtained only in the girl bystander condition but the results from the remaining conditions are suggestive and may have been conclusive with more participants. Pozzulo and Lindsay (1999) come to the same conclusion, but as said earlier, it is problematic to conduct lineups with different methods in view of the juridical consequences that may follow. In Study 3, experiment 2, the performances in elimination lineups in target-absent conditions were found to be affected by self-perception and self-doubt. Previous researchers have concluded that the elimination method is the best method available for children (Pozzulo, Dempsey, & Clarke, 2010a; Pozzulo, Dempsey, & Gascoigne, 2009; Pozzulo & Lindsay, 1999) but there are remaining drawbacks with this method as shown in study 3 where confounding variables appeared to interfere with the identifications in target-absent lineups. Again, more research is needed before we know for sure that this is the best method.

Methodological issues and limitations

The studies in this dissertation may be criticised because the participants knew that they took part in experiments without

consequences for anybody if they should report incorrect memories or identify the wrong person (Wells, 1993). If real crime witnesses had participated strong emotions can be expected to interfere with memory performance and the results would have been more trustworthy. A possible alternative would be to let the participants believe that they witnessed a real crime. However, this is not acceptable from an ethical point of view and experiments with real crime witnesses would be even less tolerable and impossible to carry out for practical reasons. In Study 2 and 3 some children were still quite tense and a little worried to make wrong decisions. Thus, not few of them behaved like in a real life situation with the nervousness that often could be aroused at least to some extent in a police station. Some children may not have understood the consequences of making a false identification. Many children several times expressed that they were very unsure of their memory of the target, but they still identified suspects or bystanders as requested.

A problem that follows with experiments with many participants involved in test situations is that they could influence each other as witnesses. We tried to eliminate this source of error by using as many schools as we could and by using only one class at each school. The schools were chosen as much as possible from areas that were socio-economically comparable to reduce this possible source of variation.

Further research

Study 1 concluded that it was easier for children to recall correct information in a free recall than with focused questions. This result constitutes a base from which further research can specify more in detail how children should be interviewed when they report from a witnessed event to be able to provide the most accurate account.

Study 2 on the modified sequential lineup yielded results suggesting that the Swedish instructions seem to decrease the

amount of correct identification that is obtained from adult witnesses but, on the contrary, improve the results for children. This conclusion is not based on statistically significant results and thus further research has to be conducted to find out why the accuracy in the lineup task is affected when all the photographs are shown once before the identification is done.

The elimination procedure is a promising method for increasing children's identification accuracy. Since children and adults perform differently with this method, one major research issue is if the police should use different lineup procedures for child and adult witnesses and, consequently have to decide at what age a person ceases to perform as a child. A reasonable assumption seems to be that developmental level rather than age *per se*, is decisive here. More research has to be done to evaluate these issues. Another concern is children's inclination to frequently make false identifications. One strategy may be to decrease the pressure on the children in the witness situation.

As reviewed in the introduction, Carey, Diamond and Woods (1980) observed that overall performance in face encoding improved markedly between ages 6 and 10 and then remained at a fixed level or actually declined for several years, finally improving again by age of 16. Diamond and Cary (1977), on the other hand, found that at the age of 10 years and until the age of 16 years, accuracy in recognition tended to remain constant rather than decline. In study 2 age differences were found only in the culprit target present condition. Thus we suggest, in line with earlier research (Pozzulo, 2007), and in agreement with Diamond and Cary (1977), that children probably could be compared with adults in a lineup situation. It remains an unsolved question, however, whether an age-related decline occurs and, if so, at what age. McGivern, Andersen, Byrd, Mutter and Reilly (2002) suggested that encoding performance changes as an effect of neurological development. Evidently, the alleged decline has to be investigated further and, if

found to exist, has to be adequately explained. In any case, when more detailed knowledge about witness performance is obtained through research, psychological knowledge is required to interview children and subject them to lineup identification tasks.

Conclusions

Although a wealth of studies has been carried out with children as eyewitnesses researchers do not agree about the conclusions that can be drawn about the reliability of children's' reports, their memory capacity, at what age they can be expected to act as trustworthy witnesses etc. and thus research has to continue in this area. A general conclusion that can be drawn from our studies is that children can be as good witnesses as adults under the right circumstances. However, problems arise if the police interview children in an inappropriate way or when the suspect in the lineup is innocent. It is also an unsolved issue – not investigated in this dissertation - at what age children can be trusted to deliver reliable reports about crimes they have witnessed, particularly if they are the victims.

Taken as a whole we can conclude that the results from lineups are rather unsatisfactory in an applied perspective. Bearing in mind that a lineup is carried out to strengthen the investigation it can be seen as an inadequate performance that only about one third of the witnesses in this dissertation were able to identify the suspect in a modified sequential lineup. With the elimination method about one fourth of the witnesses made a correct identification. Obviously, research needs to put more effort on developing methods that increase correct identifications. Much research effort has been devoted to decrease false identifications (Brewer & Day, 2005; Brewer & Palmer, 2010; Parker & Ryan, 1993; Pozzulo, Dempsey, & Wells, 2010; Pozzulo & Lindsay, 1999) which is a very important endeavor since false identifications increase the risk that innocent suspects are convicted. In study 2 the adults were only performing by chance in target-absent conditions and the children performed

even significantly poorer than chance, a finding that suggests that one or several irrelevant factors governed their choice. Much research report results on witnesses' performance in terms of changes in levels of accuracy with various experimental designs. These reports describe the number of details or items in the crime event the witnesses report but their accuracy may not differ from chance or be even worse than chance. The elimination method promises to be one way that can be used to increase correct identifications and decrease false identifications with child witnesses (Pozzulo, et al., 2008; Pozzulo, Dempsey, & Gascoigne, 2009; Pozzulo & Lindsay, 1999). In study 2 the children also were less overconfident in the elimination method than in modified sequential method.

Very little research has been done so far on variables that may affect the quantity and quality of child witnesses' reports. In study 3 in this dissertation self-perception and self-doubt were shown to affect the identification in target-absent lineups. A child's personality features may play a greater role in her/his performance as a witness than we know today and should be subject to further research. Likewise, situational aspects of the witness situation, other than lineup designs, should be investigated.

In view of the very important part a witness could be in helping a criminal investigation to move forward, it is imperative that we critically evaluate variables that may increase our knowledge of witnesses' ability to supply accurate information in interviews and lineups.

An unequivocal and positive finding is that interviews with a free recall format, compared with focused questions, generate significantly more accurate descriptions of a witnessed event. To sum up, we conclude that investigators ought to initiate an interview with free recall and follow up with focused questions only when a specific detail has to be straightened out.

An overall comparison of the identification accuracy in target-present versus target-absent lineups shows that in *target-present* lineups carried out according to the modified sequential method, the adult participants had a higher frequency of correct identifications of the culprit than the children whilst adults and children accomplished on the same level when they identified the boy bystander. These differences between adults and children disappeared with the elimination method where the children provided nearly the same proportion of correct identifications of the culprit as the adults did with the modified sequential methods and an even higher proportion of correct identifications of the boy bystander than the adults. In *target-absent* lineups with the elimination method the children's performance was comparable with the adults' performance with the modified sequential method, and they surpassed the adults in the boy bystander condition. A conclusion to be drawn from these results is that when lineups are carried out with the elimination method children perform as well as adults whether the target is present or absent.

At first sight the results showing improvements in terms of frequencies of correct identifications with different lineups methods may seem promising but comparing the figures with what can be expected by chance it turns out that it is only in target-present lineups that both adult and children identify the target better then chance. In target-absent lineups, a condition which is particularly critical in view of the possible consequence that an innocent person may be falsely identified as the culprit, and where much research has been invested, we can conclude that neither adults nor children perform better than chance in either of the lineup methods. An obvious implication of this state of affairs is that lineups should be carried out selectively and its results should be interpreted cautiously. Future research should aim to increase our understanding of the mechanisms that govern the identification

process in lineups and find methods to decrease false identifications.

Summary in Swedish / Svensk sammanfattning

Barn som vittnen: Minnesåtergivning och olika metoder för vittneskonfrontationer

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Den här avhandlingens syfte var att undersöka hur väl barn kan återberätta en bevittnad händelse och vid behov identifiera en misstänkt gärningsman i en ”lineup”, en vittneskonfrontation där en misstänkt tillsammans med fem personer som liknar den misstänkte presenteras på fotografier. Tre studier genomfördes. Den första studien undersökte barns förmåga att återberätta en händelse fritt jämfört med när de besvarar fokuserade frågor. Den andra studien jämförde två typer av vittneskonfrontation där ett vittne får se 6 fotografier antingen alla på en gång (elimineringskonfrontation) eller en i taget (sekventiell konfrontation) och bland dessa skall försöka identifiera en person som hon eller han har sett tidigare i en kort film där ett brott begås. Studie tre undersökte om ett vittnes självtvivel eller självbild påverkade identifikationen vid en vittneskonfrontation.

Barn kan bli vittnen till en rad olika brott, såsom stöld, skadegörelse, misshandel och mord. När ett barn är det viktigaste ögonvittnet till ett brott, är det viktigt för polisen att veta om de kan lita på barnets förmåga att identifiera den misstänkte eller att återberätta händelsen. Här bör man skilja på olika slags förmågor hos barnet eftersom de förmodligen inbegriper olika mekanismer som gör det möjligt att återhämta upplevda händelser ur minnet.

Studie 1 undersökte minnesförmåga och realismen i vittnenas bedömningar av korrektheten i sina minnen (konfidensbedömning) hos 8-9 år och 12-13 år gamla barn och vuxna. Mer specifikt undersökte vi sambandet mellan realismen i vittnenas konfidensbedömningar och hur korrekt de återgav en händelse,

antingen i fritt återberättande eller genom att svara på fokuserade frågor. Två experiment genomfördes i denna studie. I Experiment 1 var deltagarna 62 barn, varav 31 var 8-9 år gamla och lika många var 12-13 år, samt 32 vuxna. Materialet var en 4 minuter lång video med en iscensatt händelse, där en man letar efter sin försvunna hund.

Vid ett första möte visades videobandet för cirka 15 personer i taget. En vecka senare, vid ett andra möte, intervjuades varje deltagare individuellt. Först fick de fritt återberätta händelsen, därefter besvarade de en enkät med 39 fokuserade frågor om innehållet i filmen och där varje fråga hade två svarsalternativ. Vid det tredje mötet, en vecka senare, fick deltagarna konfidensbedöma korrektheten i sina intervjusvar samt svaren på de fokuserade frågorna i enkäten.

I Experiment 2 var deltagarna 95 barn i samma ålder som i Experiment 1 och 38 vuxna. Materialet var en 3 minuter och 50 sekunder lång video med en iscensatt händelse, som visar en kvinna vid en busshållplats. Kvinnan kidnappas av tre män i en bil. Deltagarna fick besvara fyrtiofyra fokuserade frågor om människornas kläder, hårfärg och andra detaljer runt busshållplatsen där händelsen ägde rum. Mötena genomfördes på samma sätt som i experiment 1.

Experiment 1 visade att vid fritt återberättande återgav de vuxna deltagarna betydligt fler detaljer i sina rapporter än barnen i båda åldersgrupperna. Det fanns inga skillnader mellan barngrupperna. Korrektheten var högre i fritt återberättande än i svar på fokuserade frågor i alla åldersgrupperna. Alla deltagarna bedömde också sina svar vid fritt återberättande som mer säkra än svaren på de fokuserade frågorna. En analys av över-/underkonfidens (en övertro respektive underskattad tilltro till korrektheten i de egna svaren) visade att de äldre barnen var mer överkonfidenta än både de yngre barnen och de vuxna. De yngre barnen och de vuxna

skiljde sig inte åt. Det fanns ett samband mellan typ av fråga och åldersgrupp, som innebar att skillnaden i konfidens mellan de två typerna av frågor var större för de vuxna än för de yngsta barnen.

Experiment 2 visade en signifikant skillnad mellan åldersgrupperna för fullständighet, dvs antalet rapporter ökade med åldern vid fritt återberättande. Korrektheten i svaren var, liksom i experiment 1, högre vid fritt återberättande än i svaren på fokuserade frågor. Det fanns inga signifikanta skillnader mellan åldersgrupperna i deras svar på fokuserade frågor. Även i experiment 2 fanns en signifikant interaktion mellan åldersgrupp och typ av frågor av samma innebörd som i experiment 1. Det fanns också en betydande skillnad mellan åldersgrupperna när det gäller fritt återberättande i det att de äldre barnen var mindre korrekta än både yngre barn och vuxna. Dessa skillnader fanns inte för fokuserade frågor. Deltagarna var också mer överkonfidenta i bedömningarna av sina svar på fokuserade frågor.

I både experiment 1 och 2 visade de yngre barnen näst intill perfekt realism i sina konfidensbedömningar av fritt återberättande men inte av sina svar på fokuserade frågor. Detta tolkade vi som ett resultat av att det är lättare för barn att rapportera fritt från minnet än att svara på fokuserade frågor. Därför kan det vara viktigt att börja med ett fritt återberättande med yngre barn i ett förhör.

I **Studie 2** undersökte vi hur väl sekventiell vittneskonfrontation, utförd enligt den svenska polisens instruktioner för vittneskonfrontationer, fungerar för barn. Detta jämfördes med elimineringskonfrontation. Vid en sekventiell vittneskonfrontation visar man ett foto åt gången och vittnet får ta ett beslut om det föreställer gärningsmannen eller ej. När alla fotografierna har visats avslutar man sessionen. Den svenska rekommendationen skiljer sig från den i USA mest använda, och som den svenska rekommendationen baseras på, på så vis att man visar alla fotografierna, ett i taget, en gång först och därefter en andra gång

då vittnet får ta ett beslut om det föreställer gärningsmannen eller inte. I Sverige har man också valt att utföra konfrontationen så att man ska se alla fotona även om en identifikation har skett dessförinnan. I studien testades metoden på såväl barn som vuxna eftersom tidigare forskning har visat att en sekventiell metod inte fungerar lika bra för barn. Det stora problemet med barn är att de gör många falska identifikationer speciellt i en konfrontation som inte har någon misstänkt med bland fotona. Detta ökar risken att en oskyldigt misstänkt blir identifierad. Elimineringsmetoden har förespråkats för barn (Pozzulo & Lindsay, 1999) och jämfördes därför i denna studie med den modifierade sekventiella metoden.

I experiment 1 testades den svenska modifierade sekventiella metoden. Tvåhundrafyrtioen barn i 11-års åldern och 120 vuxna som jämförelsegrupp ingick. Vi valde att avsluta konfrontationerna direkt efter det att en identifikation gjorts eftersom tidigare forskning har visat att det är mycket vanligt att barn gör upprepade identifikationer om man inte avbryter sessionen när de valt ett foto som föreställande den misstänkte. I experiment 2 testades elimineringsmetoden. Tvåhundrafyrtio barn i samma ålder som experiment 1 testades. Inga vuxna ingick i experiment 2.

Vid första mötet visades en film på knappt 3 minuter av ett rån i en affär där en person begår ett rån som bevittnas av en pojke och en flicka. Därefter fyllde barnen i en av två självskattningsformulär som mäter självtvivel (The Judgmental Self-Doubt scale) respektive självbild (Harter's Self-Perceived Scale). Enkätens syfte var dels att tjäna som avledningsmanöver från filmen och dels för att senare användas i studie 3. En vecka senare testades barnen ett och ett i ett grupprum. De fick identifiera gärningsmannen och ett av barnen i filmen i en modifierad sekventiell konfrontation eller i en elimineringskonfrontation. Både konfrontationer med gärningsman närvarande (target-present) och frånvarande (target-absent) användes. Sex foton ingick i varje konfrontation.

När en modifierad sekventiell metod användes visade det sig att deltagarna identifierade gärningsmannen och vittnena bättre än vad som kan förväntas rent slumpmässigt när gärningsmannen fanns med bland fotona i konfrontationen, men när gärningsmannen var frånvarande kunde vare sig de vuxna eller barnen prestera bättre än slumpen. Barnens resultat var till och med signifikant sämre än slumpen. När gärningsmannen var med bland fotona presterade de vuxna bättre än barnen.

När elimineringsmodellen användes presterade barnen bättre än slumpen när gärningsmannen var med i konfrontationen. När gärningsmannen inte var med presterade de på slumpnivå. När de skulle identifiera flickan som vittne presterade barnen signifikant bättre med elimineringsmetoden både när gärningsmannen var närvarande och frånvarande. När gärningsmannen var frånvarande minskade antalet falska identifikationer så mycket med elimineringsmetoden att barnen till och med hade färre antal falska identifikationer än de vuxna i den modifierade sekventiella metoden. Barnen hade högre konfidensvärden vid konfrontationer med elimineringsmetoden än med den sekventiella metoden och var samtidigt mindre överkonfidenta.

Resultaten pekar mot att vi kan dra slutsatsen att barn identifierar en gärningsman i samma ålder som de själva med samma säkerhet som vuxna men inte är lika effektiva som vuxna när det är en vuxen person de ska identifiera. Detta gäller när gärningsmannen är närvarande vid en konfrontation men inte när gärningsmannen är frånvarande i konfrontationen. Både barn och vuxna är generellt överkonfidenta, dvs de överskattar sin förmåga att identifiera en gärningsman eller ett vittne vilket innebär att polisen bör vara försiktig med att bedöma korrektheten i deras identifikationer efter hur säkra de är, dvs deras konfidens.

Studie 3 undersökte om förmågan att göra korrekta identifikationer och konfidens vid en vittneskonfrontation

korrelerade med hur man såg på sig själv respektive ens beslutsförmåga. Data samlades in på samma gång som studie 2 varför proceduren är likadan i båda studierna.

Denna studie skall ses som ett första försök att undersöka om det finns samband mellan hur man ser på sig själv och sin beslutsförmåga och hur väl man kan identifiera en misstänkt i en vittneskonfrontation. Resultatet visar att det skulle vara intressant att undersöka detta vidare.

Vid konfrontation enligt den modifierade sekventiella metoden erhölls inga signifikanta resultat, dvs självskattningarna korrelerade inte med vare sig korrektheten i deltagarnas svar eller med deras bedömningar av säkerheten i svaren. I den försöksbetingelse när ingen gärningsman fanns med i konfrontationen fanns dock signifikanta negativa samband mellan hur man såg på sig själv och sin beslutsförmåga å ena sidan och korrektheten i svaren å den andra, dvs deltagare som hade en låg uppfattning om sin förmåga att fatta beslut och en sämre självbild, bedömde sina svar som mindre säkra. De signifikanta värdena som erhölls i konfrontationer med gärningsmannen frånvarande kan tolkas som ett tecken på att självkritiska vittnen reagerar adekvat när ingen gärningsman finns med i en vittneskonfrontation. Detta skall ställas mot resultaten i övrigt som visar att vittnen ofta är överkonfidenta dvs har en överdriven tilltro till sina utsagor.

En övergripande slutsats är att elimineringsmetoden förefaller ha potential som en lämplig metod när barn skall delta i vittneskonfrontationer men att den behöver utvecklas och prövas ytterligare innan den kan rekommenderas som ”golden standard” i svenskt rättsväsen.

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