

EYEWITNESS IDENTIFICATION IN THE DEVELOPMENTALLY DELAYED

by

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Abstract

Developmentally delayed individuals are more likely to be witnesses to crime than the average population because of their increased vulnerability to sexual and physical assaults. Knowing how eyewitness memory in the developmentally delayed behaves in these types of situations would help police and the judicial system to ensure that these individuals are given fair access to the courts and that their testimony is considered appropriately. To examine eyewitness memory, 22 developmentally delayed participants and 23 control participants underwent a scripted interactive encounter with a confederate. One to two weeks following the interactive encounter, participants were interviewed about their memory for the event and were asked to identify the person they had dealt with in the interactive encounter. Half of the participants were shown target-present and half were shown target-absent sequential line-ups. The interview followed the step-wise interview structure (Yuille, Hunter, Joffe, & Zaparniuk, 1993), beginning with a free narrative, followed by open questions, and asking close-ended questions only if necessary. Leading questions, to test for suggestibility, were asked at the end of the interview, to ensure that they did not contaminate the majority of the interview. The interview was scored for number of action and descriptive details. Contrary to the literature, results indicate that developmentally delayed participants do not perform as well as controls with a target-present line-up, but no significant differences were found between participant groups with a target-absent line-up. Further analysis showed that control participants performed significantly better than chance with the target-absent line-up, but developmentally delayed participants did not. A verbal overshadowing effect was evidenced for control participants, but not for developmentally delayed participants. Developmentally delayed participants performed well in the interview, showing accuracy rates similar to the control participants, although developmentally delayed participants provided fewer details than control participants. Developmentally delayed participants were vulnerable to one of the suggestive questions, but not both. These results are consistent with other research findings and are discussed in terms of their implications for the ability of developmentally delayed individuals to provide eyewitness testimony.

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Eyewitness Identification in the Developmentally Delayed

Although eyewitness identification has been studied extensively for the past 20 years (e.g., Behrman & Davey, 2001; Cutler, Penrod, & Martens, 1987; Egeth, 1993; Gorenstein & Ellsworth, 1980; Steblay, 1997; Wells, 1993; Wells, et al., 1998), very little research has focused on eyewitness identification in the developmentally delayed. This is an important area of research because developmentally delayed individuals are at an increased risk to be victims of physical attacks (Sharp, 2001) and are more vulnerable to sexual abuse and exploitation (Cole, 1986; Sobsey & Varnhagen, 1991; Tharinger, Horton, & Millea, 1990). Indeed, one researcher has estimated that the rate of abuse against individuals who are developmentally delayed may be ten times that of the general population (Balderian, 1994). Knowing their abilities for eyewitness identification would help police and the judicial system to ensure that developmentally delayed individuals are given fair access to the courts and that their testimony is considered appropriately.

The Increased Vulnerability of the Developmentally Delayed

Children, adolescents, and adults who are developmentally delayed are particularly vulnerable to sexual abuse and exploitation for several reasons, including their life-long dependence on care-givers, relatively powerless position in society, emotional and social insecurities, and lack of education regarding sexuality and sexual abuse (Tharinger et al., 1990). As well, individuals who are developmentally delayed may lack the ability to protest and/or may be physically unable to defend themselves (Sobsey & Varnhagen, 1991). While victims of sexual abuse and exploitation are often

developmentally delayed or disabled in some way, the offender may be disabled, as well. According to Sobsey and Varnhagen (1991), developmentally delayed people are more likely to be institutionalized if they are unable to protect themselves, or if they are perceived as a threat to others. This means that institutions commonly cluster sexually aggressive and assaultive individuals with defenceless victims, increasing the risk that a developmentally delayed individual will be assaulted.

According to Sharp (2001), incidents of harassment and crime are rarely reported to the police, and when they are reported, the police often make ill-informed judgements about the complainant person and how to respond. Current prevention efforts and treatment services often fail to meet the needs of people who are developmentally delayed and that failure becomes increasingly common as a function of the severity of the disability (Sobsey & Varnhagen, 1991).

Furthermore, crimes such as sexual abuse are more frequently committed by someone known to the person who is developmentally delayed, for example, a relative or a staff member working with the person (Brown, Stein, & Turk, 1995). Statistics have shown that 99% of perpetrators are known to the victim (Balderian, 1991; as cited in Balderian, 1994). In cases such as these, where witnesses and physical evidence are rarely available to corroborate the allegations of sexual abuse victims, eyewitness testimony is essential in securing a conviction.

While crimes such as sexual abuse are more frequently committed by someone known to the victim, other violent crimes are often committed by a stranger. For example, Reiss and Ross (1993) reported 12.2 – 21.2 % of violent crimes are perpetrated by someone whom the victim does not know. In situations such as these, where the

victim did not know the perpetrator prior to the incident, eyewitness identification evidence can be an important means of ensuring that the person responsible for the crime is found guilty. Since developmentally delayed individuals are 2.9 times more likely to be victims of physical assault, and 12.7 times more likely to be victims of robbery than individuals of normal intelligence, it is very important to assess their abilities for eyewitness identification (Petersilia, 2000).

Police officers have reported that eyewitness testimony provides the major evidence for criminal investigations (Kebbell & Milne, 1998). However, the general view among care providers and professionals in the criminal justice system is that developmentally delayed individuals do not make competent eyewitnesses (McNulty, Kissi-Deborah, & Newsom-Davies, 1995). As a result, incidents in which developmentally delayed individuals are the victims of crime are not likely to be reported to the police.

Moreover, according to Valenti-Hein and Schwartz (1993), developmentally delayed victims have been excluded from the legal system based on the belief that they are incompetent to provide accurate, reliable testimony. Restrictions such as these contribute to the increased risk that people who are developmentally delayed will be victimized.

Eyewitness Memory in the Developmentally Delayed

In an attempt to address these concerns, researchers have examined the ability of the developmentally delayed to provide eyewitness testimony. For example, Henry and Gudjonsson (1999) examined how well developmentally delayed children were able to

recall a live staged event one day later compared to chronological-age (CA) and mental-age (MA) comparable peers. They found that developmentally delayed children performed well on many measures of eyewitness memory performance, reaching the level of the CA-comparable group for free recall, general questions, open-ended questions, and correctly leading questions.

Similarly, Michel, Gordon, Ornstein, and Simpson (2000), found that developmentally delayed children accurately recalled features of a personally experienced event, provided detail, and resisted misleading questions about features that did not occur. In this study, developmentally delayed children performed similarly to MA matches on all of the memory variables, but worse than the CA matches on most of the memory variables.

Several researchers have examined the abilities of developmentally delayed children and children of normal intelligence to remember and discriminate activities that were actually performed from those imagined (Gordon, Jens, Hollings, & Watson, 1994; Jens, Gordon, & Shaddock, 1990). In the earlier of these two studies, children were matched by chronological age; in the later of these two studies, children were matched by mental age. In both studies, few differences were found between developmentally delayed children and children of normal intelligence. Overall, the children in both groups remembered activities performed better than those imagined. Developmentally delayed children gave fewer correct responses to specific questions but were equivalent to children with normal intelligence in responses to open-ended questions. Error rates for specific questions were higher than for open-ended questions for both groups. All children performed well at resisting misleading questions, although the performance of

both groups deteriorated over a 6-8 week delay. Memory for performed activities was more resistant to decay than imagined activities.

A person's competency as an eyewitness may include his or her ability to identify faces. Dobson and Rust (1994) examined the visual recognition skills of developmentally delayed high school students and high school students of normal intelligence by teaching both groups to recognize faces and objects and testing them for recognition one week, one month, and two months later. There were no significant differences between the two groups in memory for faces on any of the retest trials. Both groups remembered faces significantly better than they did objects and memory for the object pictures decayed over time. There was no significant loss over time in memory for faces. These findings suggest that developmentally delayed individuals are as able to recognize faces as individuals of normal intelligence.

Only one study has looked at eyewitness identification abilities in the developmentally delayed. Ericson and Isaacs (2003) found that developmentally delayed participants made as many correct identifications in target-present line-ups as control participants who were not developmentally delayed. However, developmentally delayed participants were more likely than control participants to guess and make false identification in target-absent line-ups. The main limitation of this study involves the fact that participants viewed a film and made an identification from that, rather than identifying a person they had actually encountered in the real world. There is some data (e.g. Steblay, Dysart, Fulero, & Lindsay, 2001) to indicate that the processing of film images is very different from the processing of actual faces, which limits the

generalizability of studies that have participants make an identification based on viewing a person on film.

Suggestibility, Acquiescence, and Naysaying

Of particular concern to researchers have been the issues of interrogative suggestibility, acquiescence, and naysaying in the developmentally delayed. Interrogative suggestibility has been defined as the extent to which people come to accept ideas communicated during formal questioning, which affects their behavioural response (Clare & Gudjonsson, 1993). Acquiescence describes the tendency to answer questions affirmatively, regardless of their content, while naysaying is responding negatively to oppositely worded question pairs (Shaw & Budd, 1982).

In Michel et al.'s (2000) study, developmentally delayed children resisted incorrectly answering misleading questions. However, the authors noted that misleading questions used in this study were presented in a gentle and nonpressuring manner, and that the developmentally delayed children may have appeared more susceptible to suggestion if the questions had been posed in a more forceful manner or had been repeated over several successive interviews.

Henry and Gudjonsson (1999) found that developmentally delayed children who completed standardized measures of suggestibility and recall obtained scores comparable to MA-comparable children for overall suggestibility, yield, and free recall, whereas CA-comparable children performed significantly better on all three measures.

Clare and Gudjonsson (1993) administered measures of interrogative suggestibility, confabulation, and acquiescence, to participants with mild learning

disabilities and to average ability counterparts. It was found that participants with learning disabilities were more suggestible (more susceptible to leading questions), confabulated more and were more acquiescent than participants with average intellectual abilities.

Sigelman, Budd, Spanhel, and Schoenrock (1981) also examined acquiescence in a sample of developmentally delayed children and adults. An inverse relationship was found between tendency to acquiesce and intelligence: lower IQ respondents tended to acquiesce more than higher IQ respondents.

Shaw and Budd (1982) investigated social desirability, as well as intellectual limitations, as possible determinants of acquiescence and naysaying among developmentally delayed respondents. Naysaying and acquiescence occurred more frequently among lower IQ individuals. As well, naysaying occurred more frequently concerning prohibited behaviour, whereas respondents acquiesced regarding desirable behaviour. These results suggest that intellectual limitations predispose people to biased responding, while social desirability factors determine the type of bias.

A case study by Gudjonsson and Gunn (1982) involving a moderately developmentally delayed woman also investigated suggestibility. These researchers found that the participant was only suggestible about facts for which she was unsure. However, for facts that she clearly remembered, she was adamant and consistent in her replies. It was suggested that the avoidance of leading questions is as important during the preliminary and police inquiries as it is during the court hearing.

Interviewing the Developmentally Delayed

Kebbell and Hatton (1999) conducted a review of evidence concerning eyewitness testimony given by developmentally delayed people in court. This review of the literature suggested that developmentally delayed individuals are able to provide reasonably accurate accounts of events they have witnessed. However, those accounts were usually less complete than those provided by individuals who were not developmentally delayed, and were influenced to a great extent by the way in which witnesses were questioned. The use of closed, complex, and leading questions and the absence of aids to recall had a particularly adverse effect on developmentally delayed individuals. The authors recommended that great care be taken in questioning developmentally delayed witnesses to reduce memory distortion.

Other researchers have also stressed the importance of the interview in achieving the optimal testimony from developmentally delayed eyewitnesses. For example, Dent (1986) investigated the accuracy of recall of a live incident by developmentally delayed children in response to free recall, general questions, and specific questions. For the developmentally delayed children, the optimal combination of complete and accurate recall was produced in response to the general questions. In contrast, children of normal intelligence responded optimally to free recall questions.

In a review of the literature examining the best approach to obtain the maximum quality and quantity of information from developmentally delayed individuals, Milne and Bull (2001) examined various interviewing procedures. The authors found that the main difficulty in interviewing developmentally delayed individuals concerns errors of

omission. The use of the cognitive interview, as compared to a standard interview, was found to enhance the amount of recall. However, for developmentally delayed individuals, the use of the cognitive interview produced a disproportionate increase in the reporting of person confabulations. Despite this, the accuracy ratios were similar across interview types.

Perlman, Ericson, Esses, and Isaacs (1994) compared developmentally delayed individuals and individuals of normal intelligence in their ability to report on witnessed events in response to free recall, very general questions, short-answer questions, specific questions, and statement questions. Developmentally delayed participants did not provide as complete responses to free recall and very general questions as participants of normal intelligence, although the information provided by both groups tended to be very accurate. Both groups, particularly developmentally delayed individuals, were less accurate in responding to more focused short-answer recall questions. In response to correct leading specific and statement questions, requiring recognition of the information provided, developmentally delayed and control participants performed similarly. Developmentally delayed participants had greater difficulty than controls with misleading recall questions and false leading specific and statement questions.

Kebbell, Hatton, Johnson, and O'Kelly (2001) analyzed the transcripts of court cases involving developmentally delayed witnesses and matched court cases involving witnesses who were not developmentally delayed to determine the kinds of questioning used by lawyers in courtrooms which can cause problems for developmentally delayed witnesses. The authors concluded that hostile lawyers tend to use constraining and coercive questioning strategies, which have a particularly negative impact on

developmentally delayed witnesses. The authors suggest that judges rephrase lawyers' leading or complex questions to make them easier for the witnesses to understand to ensure a fair trial. They also recommend that judges be informed of appropriate and inappropriate lawyer questioning strategies in advance of trials to enable them to effectively manage the questioning of lawyers in the courtroom.

Ericson, Perlman, and Isaacs (1994) offered some suggestions to interviewers who are questioning developmentally delayed individuals. They suggest that interviewers be aware that developmentally delayed individuals sometimes have visual, vocal, or auditory impairments and may require communication support. Interviewers should ensure that communication aids, such as hearing aids, eyeglasses, and an interpreter for sign language, are in place to maximize communication efficacy. When interviewing a developmentally delayed client, interviewers should invite a family member or support person to provide comfort to the victim or witness. Interviewers should be aware that developmentally delayed individuals sometimes have short attention spans and should arrange for more frequent meetings of shorter duration. To ameliorate the problem of suggestibility or compliance with authority, interviewers should avoid the use of leading questions. Interviewers should advise a developmentally delayed client that it is acceptable to say, "I don't know" when he or she is uncertain to the answer to a question. Interviewers should be cautious about the use of abstract words or terms, always confirming that the client understands particular terms; avoid the use of long, run-on sentences; should not ask more than one question at a time; be aware that developmentally delayed individuals often have difficulty with time concepts and be very cautious about trying to get the client to pinpoint specific dates and times; be honest with

the client about what the courtroom experience will be like, and prepare the client for all possible court outcomes; and prior to the trial, if possible, allow the client to visit the courtroom to familiarize him or her with the setting and the manner in which courtroom proceedings are conducted. Ericson, Perlman, and Isaacs (1994) conclude that with proper interview supports, developmentally delayed individuals may be competent witnesses.

Specific interview methods have been found to confidently elicit reliable and accurate information from individuals with developmental disabilities. For example, the stepwise semi-structured interview has been developed to help interview children by maximizing recall while minimizing contamination (Yuille, Hunter, Joffe, Zaparniuk, 1993). This interview method takes a funnel approach to questioning. The interviewer begins by asking general questions, then proceeding to specific questions as required. It has been empirically proven that this approach, which focuses on an uninterrupted free narrative and a higher proportion of open-ended questions than specific/close-ended questions, elicits more unbiased accounts than traditional interview methods (Porter, Yuille, & Bent, 1995). Although this interview is geared towards children, it has a number of salient features that have been shown to be valuable in interviewing individuals, both adults and children, who are developmentally delayed. These include assessing the eyewitness's ability to tell the difference between a lie and the truth, having the eyewitness provide a free narrative of the event witnessed or experienced, and asking non-leading general and specific questions. Following this interview method, one could abide by the recommendations put forth by researchers who have considered interviewing

the developmentally delayed.

Assessing Capacity of Developmentally Disabled to be Witnesses in Court

Other research concerning the developmentally disabled as eyewitnesses has involved assessing the capacity of developmentally delayed individuals to be witnesses in court, in relation to issues such as consent, competence, and ability to withstand court procedures of a witness. For example, in a case study by Green (2001), the capacity of a developmentally delayed witness who had alleged abuse by her paid carer was assessed. The results of an adaptive behaviour assessment suggested that this individual's coping skills and emotional maturity, though limited, were adequate for a range of community activities, implying that she would be able to cope with court procedures, provided she received sufficient support and preparation.

Gudjonsson, Murphy, and Clare (2000) also assessed the capacity of developmentally delayed individuals to be witnesses in court. The participants in this study, all of whom were potential witnesses of ill-treatment, were assessed to determine their capacity to be interviewed for judicial purposes. The assessments included evaluations of each participant's intellectual ability, memory, acquiescence, suggestibility, and their ability to explain concepts relating to the oath. Most of those with an IQ score of 60 or greater had a basic understanding of the oath, compared with only a third of those with an IQ score between 50 and 59, and none of those with IQ scores less than 50. Even so, some of the participants who were unable to demonstrate an understanding of the oath did understand the words "truth" and "lie." The authors concluded that, although intellectual ability seemed to be the best overall predictor of the

capacity of mentally challenged individuals to act as witnesses, confining witnesses to those who could explain the meaning of the oath would mean that a number of individuals who might be interviewed by the police and subsequently appear in court could be excluded from the judicial process.

Smith and Hudson (1995) developed a quick screening test of competency to stand trial for developmentally delayed defendants. This screening test is relevant in determining the competency of developmentally delayed witnesses to provide testimony. Competent defendants could be differentiated from incompetent defendants in their understanding and ability to define the terms: "court strategy," "plead," "testify," and "jury." That is, competent defendants were able to define these terms while incompetent defendants were not. A similar screening test could be developed for determining the competency of developmentally delayed witnesses to provide testimony by examining their understanding of terms relevant to providing eyewitness testimony, such as "truth," "oath," and "lie."

Research on Eyewitness Identification

As mentioned previously, a great deal of research in the past twenty years has concentrated on eyewitness identification. This specific aspect of eyewitness testimony has received a particularly strong focus from researchers because false identification can directly incriminate an innocent suspect (Wells et al., 1998). Many researchers have examined the relationship between confidence and accuracy in eyewitness identification. Sporer, Penrod, Read, & Cutler (1995) conducted a meta-analytic review of 30 studies using staged event methods to investigate the relationship between confidence and

accuracy in eyewitness identification. The overall confidence-accuracy correlation in these studies was low, corresponding to that reported in previous reviews ($r = .29$). However, including choice as a moderator variable lead to a somewhat different conclusion. That is, for choosers (those making positive identification), the confidence-accuracy correlation was reliably and consistently higher than for nonchoosers. In addition, the mean confidence level for correct choosers was higher than that for incorrect choosers in every study.

Researchers have also studied the impact of biased line-up instructions on eyewitness identification performance from line-ups. According to Steblay (1997), biased instructions suggest to the eyewitness that the perpetrator is in the line-up, otherwise discourage a “not there” response, or suggest a perpetrator to the eyewitness. Steblay (1997) conducted a meta-analysis of 18 studies to investigate the hypothesis that biased instructions lead to greater willingness to choose and less accurate line-up identifications. It was found that a significantly higher level of choosing followed biased instructions. The increased level of choosing following biased instructions resulted in reduced identification accuracy in target-absent line-ups. Biased instructions within a target-present line-up generated a higher level of confidence, but had minimal impact on accuracy. This finding is particularly relevant to studying eyewitness identification in the developmentally delayed because of their increased susceptibility to suggestion.

Researchers have also considered the influence of line-up procedures on the accuracy of eyewitness identification. These studies have been based on the fact that most police line-ups use simultaneous presentation techniques in which eyewitnesses view all line-up members at the same time (Steblay et al., 2001). Lindsay and Wells

(1985) devised an alternative procedure, the sequential line-up, in which witnesses view one line-up member at a time and decide whether or not that person is the perpetrator prior to viewing the next line-up member. Steblay et al. (2001) used the meta-analytic procedure on 23 studies to compare the accuracy rates of the simultaneous and sequential presentation styles. Results showed that correct identification of perpetrators from target-present line-ups occurred at a higher rate from simultaneous than from sequential line-ups. However, this difference disappeared when moderator variables approximating real world conditions, such as witnesses viewing live staged events, were considered. Correct rejection rates were significantly higher for sequential than simultaneous line-ups, and this difference was maintained or increased by greater approximation to real world conditions.

Some researchers have been concerned with the fact that the participants in eyewitness studies usually know that their identification will not have consequences in the real world. They know that they are simply identifying a person for a psychology study, and that no one will be in trouble as a result of their identification. This knowledge could have an effect on the generalizability of the results. In a real assault situation, the victim is identifying someone who may face criminal charges as a result of the identification. A study by Foster, Libkuman, Schooler, and Loftus (1994) addressed this issue. These researchers found that witnesses who believed that their identification would have consequences in the real world were no more accurate than witnesses who did not share this belief.

Some researchers have looked at the ability of children to provide eyewitness identification evidence. This research is pertinent to the study of the developmentally

delayed because of their tendency to perform similar to their MA, rather than their CA counterparts, in experimental studies (Henry & Gudjonsson, 1999; Michel et al., 2000). Although adult participants perform better on eyewitness identification tasks when a sequential rather than a simultaneous line-up is used, Pozzulo and Lindsay (1998) found that children had difficulties with sequential line-ups. In a meta-analysis, these authors found that all children, including adolescents, have low correct rejection rates in target-absent line-ups, compared to adults. This gap between adults and children increases when the line-up is presented in a sequential fashion.

Lindsay et al. (1997) studied the effect of line-up procedure on eyewitness identification accuracy in children. Children, aged three to fifteen years, and undergraduate students were tested using target-present and target-absent simultaneous and sequential line-ups and showups (i.e. the presentation of a single individual, the suspect). Correct identification did not vary across either age of the participant or identification procedure. However, children showed an increased tendency to guess, as shown by their lower rate of correct rejection when the target was absent. The tendency for children to make false positive choices was particularly evident with showups.

Ricci and Beal (1998) examined the effect of questioning techniques and interview setting on young children's eyewitness memory. The results indicated that interview setting or question technique had little influence on children's eyewitness memory, identification accuracy, and suggestibility.

To summarize, previous research has offered an optimistic prognosis for the ability of developmentally delayed individuals to provide accurate eyewitness testimony, at least at a level consistent with that of children with normal intelligence of the same

mental age. Given that, it is important to consider the level of cognitive age or mental functioning when interacting with developmentally delayed individuals in a legal setting. Interviewers should avoid specific questions and leading questions, and rely more on open-ended questions.

The Present Research

Although the ability to make an accurate eyewitness identification has not been examined in the developmentally delayed, it is an important area that should be considered. As mentioned previously, developmentally delayed individuals are more likely to be witnesses to crime than the average population because of their increased vulnerability to sexual and physical assaults. Knowing their abilities for eyewitness identification would help police and the judicial system to ensure that these individuals are given fair access to the courts and that their testimony is considered appropriately.

One way to test this is through having developmentally delayed adults, as well as controls of normal intelligence (university students), undergo an interactive procedure with a confederate, similar to the procedure performed by Michel et al. (2000), in which children experienced a simulated health check. An interactive procedure allows the experience to be controlled, while providing a salient, real-world experience that could be generalized to some extent to testimony situations. For optimal generalizability, the interactive procedure should be of a similar length as real assault situations. Real assault situations vary in time length, lasting as short a time as several minutes (Sobsey and Varnhagen, 1991). As well, the experimenter should interact physically (i.e. touch) with the participants throughout the procedure.

It was hypothesized that developmentally delayed individuals would perform similarly on the identification task as other developmentally delayed adults and those of similar mental age, given the similarities in performance shown in previous studies between developmentally delayed participants and MA matches (e.g. Henry & Gudjonsson, 1999; Michel et al., 2000). More specifically, based on eyewitness identification studies involving developmentally delayed adults (Ericson & Isaacs, 2003) and children (Lindsay et al., 1997), it was predicted that accuracy rates would be similar for the developmentally delayed group and the control group, but that the developmentally delayed group would show an increased tendency to guess when the target was not there.

It was also hypothesized that developmentally delayed adults would perform similarly in the interview to the developmentally delayed participants in the previously mentioned studies (e.g., Gordon et al., 1994; Henry & Gudjonsson, 1999; Perlman et al., 1994). That is, it was predicted that the developmentally delayed participants would perform well on the interview, showing accuracy rates similar to the control participants. However, it was expected that the developmentally delayed participants would be more suggestible to the misleading questions than the control participants.

Method

Participants

Twenty-two developmentally delayed (eight males and fourteen females) and 23 controls (ten males and thirteen females) served as participants. The developmentally delayed participants were recruited through the Developmental Disabilities Association

of Vancouver, and had a mean age of 45.60. Of these participants, 86.4% identified themselves as Caucasian, 9.1% were Asian-Canadian, and 4.5% were Indo-Asian.

Although intelligence was not measured, developmentally delayed participants will typically have an IQ of between 50 and 70. The control participants were undergraduate students at the University of British Columbia and had a mean age of 21.26. Of these participants, 52.2% identified themselves as Caucasian, 17.4% identified themselves as Asian-Canadian, 13.0% identified themselves as Indo-Asian, and 17.4% did not identify with any of the specified ethnic categories.

Interactive Procedure

The interactive procedure in the present study consisted of the participant being photographed by a confederate. During the photography session, the confederate touched the participant several times. The procedure began by the confederate introducing him or herself and welcoming the participant. The confederate then invited the participant to sit down. The confederate explained that the initial procedure consisted of photographing participants for a future identification procedure and the participant was asked to sign the consent form. Participants were not told that their memory for this event would later be tested. The confederate attempted to take the picture, but did not take it, claiming that the participant was not posed correctly. The confederate then used both hands to move the participant's shoulders to "line him or her up correctly for the camera." The confederate also used one hand to move the participant's chin so that it faced the camera. The confederate again prepared to take the picture, but did not take it, claiming that the participant's hair was out of place. The confederate then smoothed the participant's hair.

If this was not possible, the confederate would substitute an equivalent action, such as adjusting the participant's hat, glasses, or collar. At this point, the confederate took the picture. After the picture was taken, the confederate thanked the participant for his or her involvement and instructed him or her to make arrangements to meet with the experimenter for the follow-up interview. The entire procedure typically lasted less than five minutes, a time length comparable to a real assault situation.

Interview

One to two weeks following the interactive procedure, participants were interviewed for their memory for the interaction. The interview consisted mainly of open-ended questions to minimize memory distortions. The interview took the form of the previously mentioned stepwise semi-structured interview (Yuille, Hunter, Joffe, & Zaparniuk, 1993). Suggestive questions were asked at the end of the interview to ensure that they did not contaminate the majority of the interview. Suggestive questions in the present study were, "Do you remember when he/she touched your leg?" and "So, this happened in the morning/afternoon, right?" Both suggestive questions were misleading, so the latter question would refer to the time period that the interaction did not occur in.

Coding

The interview was scored using the coding procedure developed by Cutshall and Yuille (1989). This procedure began with a transposition of each participant's interview transcript from a narrative format into a list of action details and a list of both people and object descriptive details. The initial free narrative and responses to open questions were

analyzed separately from the total responses. The remaining details, responses to closed questions, were also analyzed separately from the total responses. The reliability of the transposition procedure was determined by comparing transcripts transposed by two independent raters. The variance between raters was less than five percent.

After transposing participant interviews into action and descriptive details, each component was tallied separately in terms of number of details reported. The details were scored by allocating one point for each specific, unique bit of information. Scoring the descriptive details involved separating the details in relation to noun and adjective phrases. For example, the statement "He was 5'9 and wore a white t-shirt" contains three descriptive details. Action details are present in verb and adverb phrases. For example, the statement, "She walked over and put the camera on the cabinet" contains three action details. Each detail was categorized as correct, incorrect, or unclassifiable.

Identification Procedure

Either subsequent to the interview or prior to the interview participants were asked to identify the person they had dealt with in the interactive procedure. The order of interview/identification was counterbalanced so that half the participants made the identification first and half completed the interview first. Finger and Pezdek (1999) found that verbal description might have deleterious effects on later identification of a target face. They demonstrated that enhancing verbal description of a face reduced subsequent face identification accuracy. This "verbal overshadowing" was reduced when a delay was inserted between verbal description and face identification. For this

reason, all participants filled out a demographic questionnaire between the interview and the identification (see appendix).

Each person was shown a photo line-up made up of eight pictures. All pictures were University of British Columbia students who matched a verbal description of one of the two confederates. Adobe® Photoshop® 6.0 was used to take the background out of each picture so that background information would not influence the participants' choices. Half of the participants were shown target-present and half were shown target-absent sequential line-ups. Participants received no feedback on their performance on the identification task, but were thanked for their assistance regardless of their performance.

Results

Identification Procedure

Chi square analysis was performed on the data from the identification procedure. An analysis was performed separately for the target-absent and the target-present procedures to examine possible differences between participant types. For the target-absent procedure, no difference was found between developmentally delayed and control participants, $\chi^2(1) = 2.56$, $p > 0.10$. A chi-square goodness of fit test was performed on the data from the target-absent procedure to determine whether each participant group differed significantly from chance. Control participants were found to significantly differ from chance, $\chi^2(1) = 21.33$, $p < 0.001$. This means that control participants correctly rejected all pictures from the target-absent line-up significantly more often than chance would expect. Developmentally delayed participants' performance on the target-absent procedure did not significantly differ from chance, $\chi^2(1) = 0.82$, $p > 0.10$. For the target-

present procedure, control participants performed significantly better on the identification task than developmentally delayed participants, $\chi^2(1) = 4.70$, $p < 0.05$. Frequencies relating to this finding are shown on Table 1.

Chi square analyses were performed separately for developmentally delayed and control participants to examine the effect of completing the identification procedure prior to or following the interview on performance on the identification task. For the developmentally delayed participants, no differences were found, $\chi^2(1) = 0.00$, $p > 0.99$. For the control participants, performance on the identification procedure was significantly better when identification occurred prior to the interview than when identification occurred following the interview, $\chi^2(1) = 9.60$, $p < 0.01$. Frequencies relating to this finding are shown on Table 2.

Interview Details

Initially, paired sample t-tests were performed for each type of detail (action and descriptive) to determine whether there was a difference in the number of details provided for each type of question for the two groups. For action details, no differences were found for open and closed questions, $t(44) = 1.05$, $p > 0.10$. Significantly more descriptive details were provided in response to closed questions as compared to open questions, $t(44) = 6.62$, $p < 0.01$. Because differences were found in the number of details in response to open and closed questions, it was decided to analyze them separately. Means relevant to these findings are shown on Table 3.

Differences between participant groups in number of action and descriptive details provided were also considered in response to total questions. In response to all

questions, developmentally delayed participants provided an average of 8.18 action details each, 93.4% of which were correct. They provided an average of 13.82 descriptive details each, 90.4% of which were correct. In response to all questions, control participants provided an average of 18.13 action details, 99.8% of which were correct. They provided an average of 26.30 descriptive details, 96.4% of which were correct. Means relevant to these findings are shown on Table 4.

To determine differences between groups in amount of details provided in response to all questions, a repeated measures analysis of variance, with participant group as the independent variable and number of descriptive and action details as the dependent variables, was performed. For both groups, significantly more descriptive details were provided than action details, $F(1, 43) = 63.32, p < 0.001$. Overall, control participants provided significantly more details in response to total questions than developmentally delayed participants, $F(1, 43) = 40.51, p < 0.001$. One-way analyses of variance were performed to determine more specific differences in amount of details provided by each group in response to total questions. Control participants provided significantly more descriptive details than developmentally delayed participants, $F(1, 43) = 40.09, p < 0.001$. Control participants also provided significantly more action details than developmentally delayed $F(1, 43) = 25.84, p < 0.001$. Means relevant to these findings are shown on Table 4.

In response to open questions, developmentally delayed participants provided an average of 1.64 action details each, 97.0% of which were correct. They provided an average of 2.14 descriptive details each, 95.8% of which were correct. In response to the open questions, control participants provided an average of 10.13 action details, 100% of

which were correct. They provided an average of 10.22 descriptive details, 98.2% of which were correct. Means relevant to these findings are shown on Table 5.

To determine differences between groups in amount of details provided in response to open questions, a repeated measures analysis of variance, with participant group (developmentally delayed and control) as the independent variable and number of descriptive and action details as the dependent variables, was performed. For both groups, there was no significant difference in the amount of each type of detail provided, $F(1, 43) = 0.169, p > 0.10$. Overall, control participants provided significantly more details in response to open questions than developmentally delayed participants, $F(1, 43) = 49.36, p < 0.001$. One-way analyses of variance were performed to determine more specific differences in amount of details provided by each group in response to open questions. Control participants provided significantly more descriptive details than developmentally delayed participants, $F(1, 43) = 44.07, p < 0.001$. Control participants also provided significantly more action details than developmentally delayed participants, $F(1, 43) = 31.10, p < 0.001$. Means relevant to these findings are shown on Table 5.

In response to closed questions, developmentally delayed participants provided an average of 6.55 action details each, 92.4% of which were correct. They provided an average of 11.68 descriptive details each, 89.5% of which were correct. In response to the closed questions, control participants provided an average of 7.74 action details, 99.5% of which were correct. They provided an average of 15.52 descriptive details, 94.7% of which were correct. Means relevant to these findings are shown on Table 6.

To determine differences between groups in amount of details provided in response to closed questions, a repeated measures analysis of variance, with participant

group as the independent variable and number of descriptive and action details as the dependent variables, was performed. For both groups, significantly more descriptive details were provided than action details, $F(1, 43) = 52.87, p < 0.001$. Overall, control participants provided significantly more details in response to closed questions than developmentally delayed participants, $F(1, 43) = 4.49, p < 0.05$. One-way analyses of variance were performed to determine more specific differences in amount of details provided by each group in response to closed questions. Control participants provided significantly more descriptive details than developmentally delayed participants, $F(1, 43) = 5.26, p < 0.05$. There was no significant difference in the amount of action details provided in response to closed questions between the two groups, $F(1, 43) = 0.89, p > 0.10$. Means relevant to these findings are shown on Table 6.

To determine the effect of leading questions on each group, chi square analyses were performed separately for each leading question. For the leading question dealing with leg touching, no differences were found for the two groups, $\chi^2(1) = 0.002, p > 0.10$. For the leading question dealing with time of interaction, developmentally delayed participants were found to acquiesce significantly more often than control participants, $\chi^2(1) = 5.805, p < 0.02$. Frequencies relating to this finding are shown on Table 7.

Discussion

The hypotheses concerning the identification procedure were not supported. It had been expected that accuracy rates would be similar for control and developmentally delayed participants for the target-present procedure, but that developmentally delayed participants would show an increased tendency to guess when the target was not present.

Contrary to this, differences were found between developmentally delayed and control participants for the target-present procedure, but not for the target-absent procedure. For the target-present procedure, control participants performed better than developmentally delayed participants. However, for the target-absent procedure, developmentally delayed participants and control participants did not differ in their performance. Further analysis showed that control participants performed significantly better than chance for the target-absent procedure, while the performance of developmentally delayed participants was not significantly different from chance. This suggests that while the participant groups did not differ significantly from each other, the control group actually performed better than the developmentally delayed group on the target-absent line-up.

These results differ from the results of Ericson and Isaacs's (2003) study, where developmentally delayed participants made as many correct identifications in target-present line-ups as control participants who were not developmentally delayed, and were more likely than control participants to guess and make false identification in target-absent line-ups. It is not clear why the results of these two studies are inconsistent. However, Ericson and Isaacs had participants view a film and make an identification from that, while the present study had participants actually undergo an interactive procedure with the person they would later have to identify. There is some evidence to indicate that the processing of film images is very different from the processing of actual faces. For example, as mentioned previously, Steblay et al. (2001) found that approximation to real world conditions, such as experiencing or viewing a live event as opposed to a film, resulted in higher correct rejection rates in target absent line ups. While this may or may not fully explain the results of the present study, it is possible that

the different tasks involved in each study can account for the inconsistent results. The fact that different results are found depending on how closely a study approaches real world conditions suggests that studies that use films rather than live events have limited generalizability in the real world. If the goal of eyewitness research is to apply it to real-life testimony situations, then efforts should be made to provide circumstances that approximate real world conditions.

Unexpectedly, an effect of identification time was found in the identification procedure for the control participants. Control participants performed significantly better when identification occurred before the interview than when identification occurred following the interview, despite having a delay task, as recommended by Finger and Pezdek (1999). No effect of identification time was found for the developmentally delayed participants. Perhaps, for the control participants, the short demographics questionnaire used as a delay task was not of sufficient length to combat the verbal overshadowing effect. If this is the case, verbal overshadowing may have reduced identification accuracy in the control participants who performed the identification task following the interview. It is not known why a similar effect was not found for developmentally delayed participants, but there are several possible explanations. For example, it is possible that performance on the identification task was too low in the developmentally delayed group for a verbal overshadowing effect to be evident. Verbal overshadowing is defined by performance differences depending on whether identification occurs prior to or subsequent to a verbal description of the person to be identified. That is, the verbal overshadowing effect is the failure to accurately identify a target person after providing a physical description of that person. However,

identification performance was equally low in the developmentally delayed group for both the identification prior to and identification subsequent to conditions, suggesting the identification task was too difficult for the developmentally delayed participants. This floor effect could mask any verbal overshadowing effects. Another possibility is that developmentally delayed individuals do not experience a verbal overshadowing effect. While no studies have been conducted examining this effect in developmentally delayed individuals as of yet, at least one study has examined the verbal overshadowing effect in children. Memon and Rose (2002) found that for children aged eight to nine years, verbalization of a face prior to identification had no adverse effects on identification performance. No rationalization was provided by the authors to explain why this effect is present in adults, but not in children. That the effect was not found in children is consistent with the present study in that developmentally delayed participants tend to perform similarly to children of a comparable mental age (Henry & Gudjonsson, 1999).

The hypotheses concerning the interview were partially supported. It had been expected that developmentally delayed participants would perform well on the interview, showing accuracy rates similar to control participants. The results support this. Both participant groups were very accurate in the details they provided, with accuracy levels ranging from 89.5% to 100%. While these accuracy rates are slightly higher than those found in most other studies (e.g. Henry & Gudjonsson, 1999; Perlman et al., 1994), some studies have found similarly high accuracy levels (e.g. Michel et al., 2000).

Generally, participants provided significantly more descriptive details than action details. The only exception to this was for the number of details provided in response to open questions. Here, there was no significant difference between number of action and

descriptive details provided. The differences are likely a result of the number of details that could possibly be mentioned. The short interactive procedure in the present study consisted of a limited number of actions. There were more descriptive details to report, so participants reported more descriptive details than action details.

For the most part, control participants provided significantly more action and descriptive details for open, closed, and total questions than developmentally delayed participants. The only exception to this was for the number of action details provided in response to closed questions. Here, there were no significant difference between developmentally delayed and control participants. Other researchers have also found that developmentally delayed participants provide less detail than control participants of normal intelligence (e.g. Michel et al., 2000). This result is to be expected, given the cognitive limitations of developmentally delayed individuals. According to Ericson et al. (1994), developmentally delayed individuals tend to have shorter attention spans, may have a reduced short-term memory capacity, and tend to have limited abstraction skills. By this last point, the authors mean that developmentally delayed individuals tend to be very concrete in their understanding of situations and questions and have more difficulty making inferences and understanding concepts or situations that require the ability to process and integrate complex information. Dulaney and Ellis (1991) suggest that developmentally delayed individuals encode information at a more shallow level and less elaboratively than individuals of normal intelligence. Knowing that these cognitive deficits exist in the developmentally delayed population, it had been anticipated that those participants would generally recall less than the control participants. It is also not surprising that developmentally delayed participants performed more similarly to control

participants in response to close-ended questions because the close-ended questions in the present study were general and not-leading. Other research (Dent, 1986; Perlman et al., 1994) has also found that developmentally delayed individuals perform well in interviews to questions that are general or focused short-answer.

The hypothesis concerning the suggestibility of the developmentally delayed was only partially supported. It had been expected that developmentally delayed participants would be more suggestible to leading questions than control participants. This was found for only one of the leading questions. For the first leading question, which concerned the participant's leg being touched by the confederate, developmentally delayed participants were no more suggestible than control participants. For the second leading question, which concerned the time of day that the photograph was taken, developmentally delayed participants were significantly more suggestible than control participants. The findings concerning suggestibility are compatible with the findings from Gudjonsson and Gunn's (1982) case study. In this case study, the authors found that the participant was suggestible only about facts for which she was unsure. For facts she clearly remembered, the participant was adamant and consistent in her replies. In the present study, participants clearly remembered that the confederate had not touched their leg, so they did not acquiesce to that suggestion. According to Ericson, Perlman, and Isaacs (1994), developmentally delayed individuals often have difficulty with time concepts. Given that, it is reasonable that they were more suggestible to the misleading question concerning time of day. This finding has implications for the interpretation of the recall of developmentally delayed individuals. That is, interviewers must keep in mind that susceptibility to suggestion is context-dependent in the developmentally delayed.

There are a number of factors that would limit the generalizability of the results of the present study. Most salient is the small sample size. This may have resulted in sampling error, which would affect the results. There are several features about this type of research that make obtaining participants quite difficult. Developmentally delayed participants have to be obtained through an agency, which limits the sample to those individuals who are affiliated with the agency. Agency officials and guardians of developmentally delayed individuals tend to be very protective of these persons, so even when the individuals have been judged to be able to give consent on their own, the family can intervene if they are not comfortable with the research. Those developmentally delayed individuals who agreed, and who were able to participate, were often difficult to manage. Besides having short attention spans in general, as indicated by Ericson et al. (1994), individual participants would bring with them their own unique challenges, ranging from an unwillingness to communicate, to one participant's almost inability to communicate, due to complete hearing and speech incapacities. Added to these obstacles, the fact that the procedure required two separate appointments with the experimenter, one to two weeks apart, meant that participant attrition was a problem in both the developmentally delayed and the control groups. Many participants who took part in the initial interactive procedure with the confederate did not return for the interview portion of the procedure.

The fact that the interactive procedure was not stressful also affects how these results would generalize to a real assault situation. A real assault situation would almost certainly be stressful, and that would have an affect on the victim's memory. Some studies have found that stress negatively affects memory (e.g. Brigham, Maass, Martinez,

& Whittenberger, 1983; MacLin, MacLin, & Malpass, 2001), while others have found that stress positively affects memory (e.g. Cutshall & Yuille, 1989). Whatever the effect of stress, the present study does not account for it. This limits how well these results relate to the real world. Although it would not be ethically possible to do a laboratory study on the effect stress would have in this situation, a study in the real world, of real victims would more adequately address how well a developmentally delayed person would be able to identify someone under stressful circumstances.

Despite the limitations of the present study, several conclusions can be made. It can be concluded that the developmentally delayed individuals in the present study were not skilled at eyewitness identification. Fewer than twenty percent correctly completed the identification task. Future research should look into the reasons for their limitations and should investigate ways to improve the identification abilities of the developmentally delayed.

If one sets the results of the identification task aside, and considers only interview performance, it can be concluded that developmentally delayed individuals in the present study would make adequate eyewitnesses. Although the developmentally delayed participants provided fewer details than control participants, the information provided was very accurate.

Although most of the developmentally delayed individuals resisted being misled by suggestive questioning in the present study, it is advised that interviewers avoid the use of leading questions when dealing with this population because susceptibility to suggestion seemed to be context-dependent. Following the stepwise interview would effectively prevent the use of leading questions. As well, because of the tendency for the

developmentally delayed participants to acquiesce more often when the suggestive question was related to time, it is recommended that interviewers avoid questioning developmentally delayed individuals about time concepts as much as possible.

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Table 1

Identification procedure results: Effects of target presence/absence

Participant Type	Target Present		Target Absent	
	Correct	Incorrect	Correct	Incorrect
Developmentally Delayed	2	9	2	9
Control	7	4	6	6

Table 2

Identification procedure results: Effect of time of identification

Identification Time	Developmentally Delayed		Control	
	Correct	Incorrect	Correct	Incorrect
Before	2	9	11	2
After	2	9	2	8

Table 3

Number of action and descriptive details provided in response to each type of question

Type of Question	Action Details	Descriptive Details
Open Questions	5.98	6.27
Closed Questions	7.16	13.64

Table 4

Average number of details provided by each group in response to total questions: Total and accurate (standard deviations in parentheses)

Participant Type	Action Details	Accurate	Descriptive Details	Accurate
Developmentally Delayed	8.18 (4.65)	7.64	13.82 (4.62)	12.50
Control	18.13 (7.97)	18.09	26.30 (8.07)	25.35
Total	13.27 (8.21)		20.20 (9.09)	

Table 5

Average number of details provided by each group in response to open questions: Total and accurate (standard deviations in parentheses)

Participant Type	Action Details	Accurate	Descriptive Details	Accurate
Developmentally Delayed	1.64 (1.87)	1.59	2.14 (2.30)	2.05
Control	10.13 (6.90)	10.13	10.22 (5.25)	10.04
Total	5.98 (6.63)		6.27 (5.74)	

Table 6

Average number of details provided by each group in response to closed questions: Total and accurate (standard deviations in parentheses)

Participant Type	Action Details	Accurate	Descriptive Details	Accurate
Developmentally Delayed	6.55 (3.90)	6.05	11.68 (4.01)	10.45
Control	7.74 (4.55)	7.70	15.52 (6.80)	14.70
Total	7.16 (4.24)		13.64 (5.88)	

Table 7

Number of participants in each group who acquiesced to leading questions

Participant Type	First Leading Question (touching leg)	Second Leading Question (time of day)
Developmentally Delayed (n=22)	2	7
Control (n=23)	2	1

Appendix

Demographics Questionnaire

Participant Number: _____

Age: _____

Gender: M F

Ethnic Origin: _____